

A photograph of a field of pink coneflowers (Echinacea) growing on a grassy hill. The flowers are in various stages of bloom, with some showing dark brown centers and others with lighter, almost white, petals. The background features a dense line of green trees and a clear blue sky.

PRAIRIE ESTABLISHMENT AND LANDSCAPING

Division of Natural Heritage
Illinois Department of Natural Resources
Springfield, Illinois

Natural Heritage Technical Publication #2
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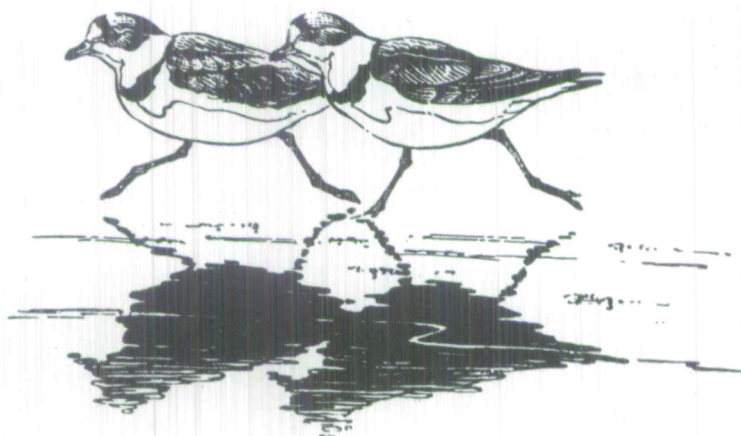
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PART I: PRAIRIE ESTABLISHMENT



INTRODUCTION

Illinois is known as the "Prairie State," a part of the vast grassland in Central North America that once stretched from Indiana west to Nebraska, south to Texas and north to the Canadian Provinces of Saskatchewan and Alberta with outlying areas in Ohio and Arkansas (Figure 1). This vast grassland, called the tallgrass prairie, was not uniform throughout except for the presence of "tall" grass. The prairies of Illinois were different from those of Minnesota, Missouri, Iowa, or Wisconsin. One prairie type graded almost imperceptibly into another, forming one huge, complex, grassland biome.

Despite its extent, the tallgrass prairie disappeared rather quickly after the arrival of the European settlers. Today, the most extensive remnants of this prairie are present in the Flint Hills of Oklahoma and Kansas where the thin topsoil makes the area unsuitable for row crop agriculture. Where the soils were deep and fertile, only small remnants remain scattered throughout the former range of the tallgrass prairie (Figure 1).

The origin of prairies was a subject of controversy among the first European settlers. Some believed that the prairies were associated with ancient lakes while others were convinced that fire had a role in their existence. It wasn't until the 20th century that good scientific data were obtained that explained how the prairies originated. In 1935, Professor E.N. Transeau of the Ohio State University published the *Prairie Peninsula* (Transeau 1935). He suggested that particular types of climate favored prairie over forest. More recent data indicate that the prairie is a relatively recent ecosystem in central North America, having developed following the last glacial epoch approximately 12,000 to 15,000 years ago (Axelrod 1985).

NATURAL DIVISIONS

Based upon bedrock geology, glaciation, soils, climate, and plant and animal distribution, Illinois can be divided into 14 natural regions and 33 distinct sections (Figure 2). From north to south, Illinois is more than 400 miles long. Throughout this 400 miles there is considerable variation in climate, topography, and soils. The southern tip of Illinois contains cypress swamps like those of the southern states. Bogs and other wetlands similar to those in Minnesota and Michigan are present in northeastern Illinois. Different types of prairie and forest remnants are present throughout much of the state.

Large prairies were known from all but eight of the 102 counties in Illinois, although the prairies were small in the southern part of the state compared to those of the north. Learn as much as you can about the prairies present in your part of the state, including their soils and plant and animal species composition. This information should serve as a basic guide to the establishment of prairie.

The landscape of Illinois once consisted of approximately 22 million acres of prairie and 14 million acres of forest (Figure 3). Prairies were largely restricted to the northern two-thirds of the state while forests were predominant along major streams and in the hill country of southern Illinois. In central Illinois, prairies were so prevalent that scattered wooded sites, known as "prairie groves," were the only local sources of wood.

Included in the 22 million acres of prairie were mesic, black soil prairies, sand prairies, and dolomite prairies. Of these, the black soil prairies were the most abundant, occurring in north-central, central, and south-central Illinois. Sand prairies were present along the Mississippi, Illinois, Green, and Kankakee rivers and along Lake Michigan while dolomite prairies were present in northern Illinois. Loess and glacial drift hill prairies were present along the south-facing bluffs of the major rivers, especially the Mississippi and Illinois River systems.

The prairies of the Driftless Section in northwestern Illinois contain plant species of the northern great plains, such as pasque flower, plains buttercup, and June grass. The sand prairies of the Illinois River and Mississippi River Sand Areas contain plants typical of the western plains, including prickly pear cactus, hairy grama grass, sand love grass (*Eragrostis trichodes*), silvery bladderpod, and Patterson's bindweed. Two plant species are largely restricted to the Western Forest-Prairie Division; the prairie trout lily (*Erythronium mesochoreum*) in the Carlinville Section and bunch flower (*Melanthium virginianum*) in the Galesburg Section. Stickleaf (*Mentzelia oligiosperma*), a distinctive western plant, is present in the hill prairies of the Middle Mississippi Border Division.

Although some of the primary plants, such as big bluestem and Indian grass, were present in many of the prairie of the various natural divisions, their species composition was different. Use the natural divisions' concept in establishing prairie communities in your part of the state.

Geology

Geologic evidence indicates that four glacial advances have occurred on what is now the state of Illinois. In order of occurrence, they were the Nebraskan, Kansan, Illinoian, and Wisconsinan glacial epochs. The two most recent glacial advances, the Illinoian and Wisconsinan, are largely responsible for the uniform flatness that now characterizes much of the state. At the end of the Illinoian glaciation, only extreme northwestern and southern Illinois plus Calhoun County and portions of Pike, Jersey, Monroe, and Randolph Counties were left unglaciated (Figure 4). The glacier advanced to a site near the present City of Carbondale, the southernmost point of glaciation in the northern hemisphere. The southern half of the state that was covered by the Illinoian glaciation is known as the southern till plain.

About 15,000 years ago the ice from the Wisconsinan glaciation covered most of the northern and east-central parts of the state. It is this glaciation that was responsible for the system of moraines in east central and northeastern Illinois (Figure 4). The area occupied by the Wisconsinan ice sheet corresponds to what would later become the Grand Prairie. This was the first major expanse of grassland encountered by the settlers after leaving the heavily forested areas of the eastern states.

About 12,000 years ago, the climate became warmer and the glaciers began to melt and retreat, forming very large glacial lakes. Several of these were contained by moraines near the present site of the City of Kankakee. As the glaciers continued to melt, the water eventually cut through the moraines and cascaded down what is now the Illinois River Valley, resulting in a huge flood known today as the Kankakee Torrent (Willman and Frye 1970).

The waters of the Kankakee Torrent carried tremendous volumes of sand and gravel downstream to the "Big Bend" at Hennepin where the river channel is narrow and entrenched in bedrock. Below Hennepin, where the river valley widens, the water lost its velocity and the sand and gravel was deposited. Other major sand deposits in Illinois may be found along the Mississippi, Kankakee, and Green Rivers, and along the shores of Lake Michigan (Figure 5). As these sand deposits dried, they were exposed to wind action, resulting in large sand dunes. On these sand deposits a truly unique ecosystem developed in Illinois, the sand prairies.

Soils

Over 600 soil types are known from Illinois, and most of these have developed from windblown silt which overlies glacial till. The windblown silt or loess was deposited during times of glacial retreat. The most recent soils are associated with the area of Wisconsinan glaciation. The soils of southern Illinois, on the area of Illinoian glaciation, are considerably older.

Mollisols, the dark-colored soils that developed under prairie vegetation, occur mostly in the northern half or two-thirds of Illinois. These thick, dark soils were formed by the decomposition of vegetation that consisted mostly of prairie grasses and wildflowers. To be classified as a mollisol, soils must have a dark surface layer at least 10 inches thick, and an organic content greater than one percent. Mollisols occupy approximately 49 percent of the state (Fehrenbacher 1967).

The other major soil group in Illinois, the alfisols, are the light-colored soils that developed under forest vegetation. The largest contiguous area of alfisols is the Southern Till Plain in the southern third of the state. These soils are less fertile than the mollisols, and large areas of the Southern Till Plain was occupied by slow-growing post oak flatwoods. Approximately 46 percent of the state is occupied by alfisols (Fehrenbacher 1967).

Another soil group in Illinois, the histosols, are soils that are high in organic content. These are wetland soils that generally have an organic content greater than 14 percent. Histosols are probably most common in the morainal district of northeastern Illinois, but they are present in seeps and marshes along rivers as well as the prairie potholes of the Grand Prairie.

Climate

After the glaciers were gone, the climate cooled and a boreal forest, similar to that found in northern climates today, covered much of the state. Nevertheless, the climate gradually became warmer and drier and the vegetation changed. Oaks and hickories replaced the pines and spruces. At this time, 12,000 to 15,000 years ago, the prairie began to make significant eastward expansions (Axelrod 1985). About 8,300 years ago, during a prolonged hot, dry era known as the xerothermic period, the tallgrass prairie became a major vegetation type in Illinois (King 1983).

The present climate of the grassland region of central North America is the continental type, characterized by hot, dry summers and cold, usually dry winters. Precipitation varies from nearly 40 inches in the eastern tallgrass prairie to as little as 10 inches in the short grass prairies of the western plains states. Within Illinois, the annual precipitation averages about 38 inches, but the southern part of the state receives about 46 inches and the north receives about 34 inches annually, mostly as rainfall during the spring and summer months (Neely and Heister 1987).

The climate of Illinois is influenced by three air masses. The coldest and driest air originates from Canada and is most frequent in winter. Warm, very humid air originates from the Gulf of Mexico during the summer and dry, warm air from the Pacific Ocean influences our weather pattern, especially in the fall during what we refer to as Indian Summer.

Illinois is subject to considerable climatic variability, including periodic and frequently severe droughts. Reconstruction of past climatic conditions in Iowa, Illinois, and Missouri using tree ring analysis indicates very severe droughts in the 1890's, and the dust bowl years of the 1930's (Blasing and Duvick 1984). The five driest decades, in the last 300 years, were: (1) 1816-1825, (2) 1735-1744, (3) 1696-1705, (4) 1931-1940, (5) 1791-1800. This research indicates that severe droughts, lasting for a decade, were a relatively common phenomenon on the prairies. Severe droughts similar to the dust bowl years of the 1930's can be expected to occur at least twice every century (Duvick and Blasing 1981). Henry Allan Gleason, a renowned plant ecologist and geographer from Illinois, stated that the environmental extremes (floods, severe droughts, cold winters, late spring freezes) were climatic factors that had the greatest influence upon the distribution of plants.

The prairie ecosystem was modified and shaped by climate, fire, soils, topography, geology, glacial history, grazing pressures and time. Within the prairie biome, there are many different prairie types, each having its own distinct plants and animals. Corresponding to a steady decline in precipitation from east to west toward the Rocky Mountains, the prairies changed from tallgrass, to mixed grass, to the short grass prairie of the western plains.

FIRE

The prairies of central North America are lands characterized by a nearly level to gently rolling topography. This is the type of terrain which provides a barrier free surface for the movement of fire. Fires eliminate the accumulation of dead leaves and stems of prairie plants and retard the encroachment of trees and shrubs. Trees and shrubs have vulnerable living tissue above ground and, therefore, are subject to the intense heat of a fire. In contrast, most prairie plants are deep rooted perennials that go dormant in the autumn and winter months leaving only dead, extremely flammable tops exposed to fire.

While climate had a major influence on determining the distribution of prairies, geographer Carl Sauer, in writing about grasslands, stated that climate alone was not sufficient to explain the presence of the extensive prairies and savannas of the world.

"The more we learn of climatic data the less success there is in identifying climate with grassland. There are grasslands with as little as ten inches of rain a year, and with as much as a hundred, with long dry seasons, with short dry seasons, with high and low temperature ranges...Every climate that has been recognized in which there are grasslands has elsewhere dominance of forest, woodlands, or brush, under the same weather conditions...Grasslands are found chiefly (a) where there are dry seasons or occasional short periods of dry weather during which the ground cover dries out, and (b) where the land surface is smooth to rolling...The occurrence (of plains) all around the world points to one known factor that operates effectively across such surfaces - fires. ...I know of no basis for climatic grassland climax, but only for a fire grass "climax"...For millennia, and tens of them, fires, for the most part set by man, have deformed the vegetation over large plains of the world (Sauer 1950)."

In Illinois, fire was used by Native Americans in hunting buffalo, deer, and other game. They used what was called a ring fire or surround in their hunting. Sometimes these fire hunts were organized by a fire chief or leader. The hunting party would set out before dawn to surround a herd of bison. When the sun had dried the grass to the point where it would burn, the fires were started and the hunt began. Penalties were severe if anyone caused the bison to stampede before the hunt (McClain & Elzinga 1994). Father Hennepin described the use of fire by the Miami Tribe near the present site of Kankakee in December of 1679:

"These animals are ordinarily in great numbers (which) is easy to judge by the bones, the horns and skulls that we saw on all sides (of the river). The Miami's hunt them at the end of autumn in the following manner: When they see a herd, they gather in great numbers and set fire to the grass everywhere around these animals except some passage which they leave on purpose and where they take post with their bows and arrows. The buffalo, seeking to escape the fire are thus compelled to pass near these Indians, who sometimes kill as many as a hundred and twenty in a day, all of which they distribute according to the wants of the families...(Hennepin 1880)."

Until their departure from Illinois in 1832, Native Americans continued to use fire in their hunting. As the pioneers arrived, some of them apparently adopted this practice because prairie fires continued to be fairly common. These fires imperiled prairie travelers and homesteaders who lived near the prairies. The fires moved with tremendous speed, stopping only where major rivers provided a break in the prairie vegetation. One such conflagration in Illinois is described below:

"In November 1836, a fire started on (the) Spoon River (Stark County) about 10 o'clock in the morning, and with a strong southwest wind, it traveled about 10 miles per hour, passing between West Bureau and Green River, having a front eight miles in width, and its roaring could be heard for many miles distant. Before sundown, this fire had burned to the banks of (the) Rock River, where Rockford now stands, passing over a country of about 60 miles in extent (Matson 1872)."

As more pioneers arrived, prairie fires were discouraged due to potential harm to livestock, building, crops and people. Roads were constructed and cultivation of the prairie began. These activities created effective firebreaks and diminished the spread of prairie fires, the force that maintained the prairies by killing trees and other woody growth. It wasn't long before large trees were standing where prairie once grew.

Fire was a friend of the prairies, but it was greatly feared and hated by the pioneers. Some called it the "Messenger of Death". Uncontrolled fires were not compatible with their life style, so they worked hard to prevent them by burning late in the spring, by plowing and backfiring strips around their settlements, using cool season grasses, and by overgrazing the land. Getting rid of the fires meant getting rid of the tall, extremely flammable native grasses, and that meant getting rid of the prairie.

PRAIRIE PLACE NAMES

From 1818 to approximately 1870, it was a common practice to name the prairies much like we refer to different towns or cities today. The origin of some of these names was based upon the presence of a certain animal or plant, their length or shape, or they took their name from the first permanent settler. This era, when Illinois was the frontier, was a colorful time, and this is certainly reflected in their names. A few of the more colorful examples are as follows:

Froggy Prairie

"The principal prairie of Honey Creek (Adams County) is called Froggy. The why and wherefore of the name is thus explained by an old settler: 'it originated at one of the old-fashioned spelling bees, where a school district from the west of the prairie was pitted against the home district. Schoolhouse, a log cabin on the prairie; time, March 25, 1844, at candle lighting, present both schools in full force; wild grass taller than a man; water, bootleg deep full of frogs, which made so much noise that the teacher was compelled to pronounce the words at the top of his voice in order to be heard at all. A school girl from the west district called the place froggy; and Froggy it has been ever since' (Wilcox 1919)."

Macoupin Prairie

The naming of places has long been a practice of man, and prairies and prairie groves are no exception. In Illinois, some prairie names were associated with Native Americans, such as Macoupin Prairie in Greene County. Its name was derived from the Indian name "Macoupin," an aquatic plant (American lotus) whose root was harvested by the Indians for food.

Crow, Horse, and Bull's Eye Prairies

Sometimes prairies were named after an animal that was particularly abundant at the site. Such is the case with Crow Prairie in Putnam County and Horse Prairie in Randolph County. The latter received its name from the wild horses inhabiting the prairie that had escaped from the French. There was a Bull's Eye Prairie along the Sangamon River in Mason County; the origin of this name is unknown. In Coles County, Goose Nest Prairie became quite famous as the home of Thomas Lincoln, the father of Abraham Lincoln. No one knows for sure if there were geese there or not.

Walnut Prairie in Clark County received its name from the abundance of walnut trees at the edge of the prairie. Buckeye Prairie in Christian County was so named because the people who settled it were from Ohio, the Buckeye state. Prairies were also named after the first pioneer to settle there. Examples include Dolson's Prairie in Clark and Cumberland counties, and Hart's Prairie in Morgan County, which was named after Rev. William A. Hart, a Baptist preacher.

Looking Glass Prairie

We can only speculate about the origins of the names of some prairies, such as Looking Glass prairie in what is now St. Clair and Madison counties. This prairie was described in the writings of the Englishman William Oliver, who traveled southern and central Illinois.

"A few miles further on we entered on a branch of Looking Glass Prairie, Bond County, where long reaches of green undulating prairie stretched away until they became lost in the haze of distance; and, within a few hours of sunset, we emerged from a grove (and the prairie) lay stretched out before us like an ocean. In the direction which the track we were following took, we could just distinguish the forest like a low bank of cloud, whilst on our right the prairie stretched away, one vast plain, uninterrupted by tree or bush, as far as the eye could reach (Oliver 1841)."

The names associated with the prairies of pioneer times have nearly disappeared. A few remain, like Walnut Prairie in Clark County, Belle City Prairie in Hamilton County, and Burnt Prairie in White County. In other cases, prairie has been dropped from the name, like Oblong in Cumberland County, Carthage in Hancock County, and Canton in Fulton County. There were hundreds of names for the prairies of Illinois. The attached list (Appendix 1) contains a few prairie place names that have been discovered from old books, letters, and manuscripts. Look for the ones in your area.

DISAPPEARANCE OF THE PRAIRIES

By 1830, farmers began to realize that the prairie soils were more fertile than forest soils and much easier to convert to agricultural use. For decades farmers had always girdled, cut, and burned trees within the forest to create fields. This realization resulted in the first earnest attempts to claim farm ground from the prairie. The breaking of the prairie was usually accomplished by a team of oxen during the month of May. Very often, this type of work was contracted out to a "sodbuster" who charged \$2 to \$3 per acre for his services (Bogue 1968). The prairie which was intensely grazed was easier to break than ungrazed prairie. Certain plants, such as red root (New Jersey tea) were difficult to plow through.

In the years following the Civil War, cultivation of the prairie accelerated due to the development of railroads which gave farmers transportation for their produce and an easy way to get wood and lumber necessary for building and heating. By 1900 most of the Illinois prairie was gone. Although most individuals did not mourn its disappearance, there were some that did. Dr. A.N. Herre, upon returning to Illinois, wrote the following:

"I returned to the region (Illinois several summers during the 1890's, but the prairie as such had disappeared, and of course, its characteristic life with it. What a pity that some of it could not have been preserved, so that those born later might enjoy its beauty also (Herre 1940)."

The disappearance of the prairie was more than the loss of vast acreages of plants. It was the loss of a huge grassland ecosystem; its plants and animals. Unfortunately, few descriptions of the bird life of the unbroken prairie are in existence. One notable exception is Dr. Robert Ridgway's description of the bird populations of Fox Prairie in Richland County from the late 1800's:

"The first visit to Fox Prairie was made on the 8th of June, 1871, the writer and his companions arriving a little before noon. A rolling plain spread before us, the farther side bounded by timber, while the prairie itself was free from tree or brush, except where some intersecting stream was followed by a narrow line of thickets, interspersed with occasional fair-sized and gracefully formed elms; or along the edge, where the jungle of sumac, thorn-bushes, wild plum, hazel, etc., backed by young oak and hickory trees, showed plainly the encroachment of the woodland.

A third visit to this prairie was made early in June, 1883 — exactly twelve years after the first trip. The change which had taken place in the interval was almost beyond belief. Instead of an absolutely open prairie some six miles broad by ten in extreme length, covered with its original characteristic vegetation, there remained only 160 acres not under fence. With this insignificant exception, the entire area was covered by thriving farms, with their neat cottages, capacious barns, fields of corn and wheat, and even extensive orchards of peach and apple trees. The transformation was complete; and it was only by certain ineffectual landmarks that we were able to identify the locality of our former visits. As a consequence, we searched in vain for the characteristic prairie birds. Upon the unenclosed tract of 160 acres, dickcissels, Henslow's buntings, yellow-winged sparrows, and the meadowlarks were abundant as ever; and running in the road, now wallowing in the dust, then alighting upon a fence stake, were plenty of prairie larks; but equally numerous were the detestable and detested European house sparrow, already ineradicably established. We searched in vain for Bell's Vireo, for all the thickets had been destroyed. Neither was a solitary kite, of either species, to be seen. We left our beautiful prairie with sad heart, disgusted with the change (however beneficent to humanity) which civilization had wrought.

The same is the history of all the smaller prairies in many portions of the state; and it will probably not be many years before a prairie in its primitive condition cannot be found within the limits of Illinois (Ridgway 1889)."

The words of Ridgway were all too prophetic, for only vestiges remain of the once vast Illinois prairies. Looking Glass Prairie, String Prairie, and the largest prairie of all, the Grand Prairie exist today as names on maps. Relatively undisturbed prairies still remain in Illinois along railroad rights-of-way, in pioneer cemeteries, or on sites that are unsuitable for row crop farming, pasture or development.

ESTABLISHING THE PRAIRIE

It is not possible to return to the days of vast expanses of prairie in Illinois. It is interesting, exciting, and even a little romantic to read about them, but they are gone forever. Today, we need to protect, manage and learn from the prairie remnants and plan and look forward to the prairie's future in restoration.

There are many reasons for entering into a prairie restoration or landscaping project, including the creation of wildlife habitat, aesthetics, education, or the sheer enjoyment of prairie plants. Unlike gardens where annual flowers are planted to produce a luxuriant garden in one year, prairie plants will require approximately three years to develop from seed. However, once established, prairie sites can be maintained with a minimal amount of effort.

Site Selection

Prairie restoration begins with site selection and the determination of the size of the project. Ideally, a level to gently rolling area which was prairie in presettlement times should be selected. For assistance in determining if prairie soil is present at a site, you may consult a local Natural Resources Conservation Service Office or the original Government Land Office Survey Records which are available in county courthouses and in the Illinois State Archives Building in Springfield. These surveys delineate the boundaries of the prairies and timber about the time of settlement in the 1820's and 1830's.

Once the site for the prairie has been finalized, the size of the restoration needs to be determined. A site that is one acre or less is large enough to represent prairie flora, but larger sites are more desirable if you want to create several prairie communities and provide additional wildlife habitat. Keep in mind that larger restorations will require considerable manpower during site preparation, planting, and initial maintenance. If you do not have the time, money, manpower, or machinery to establish and maintain a large tract, it would be best to establish a smaller, more manageable plot.

Seed Selection

Once you have selected a site and determined the acreage to be planted, you will need to acquire sufficient quantities of seed for your restoration. Several Illinois commercial nurseries specialize in the production of prairie plant seeds (Appendix 2). Some individuals believe that it is best to purchase or collect seed from a site that is within 100 miles of the restoration site in order to preserve the genetic integrity of local plant populations. When buying seed, avoid distant sources or "improved" or "selected" strains of prairie grasses and forbs. These "improved" or "selected" strains are very aggressive, a characteristic which enables them to crowd out desirable plants.

Although some prairie grasses may be purchased commercially at a reasonable cost, many grass and especially forb seeds are expensive. For this reason, you may want to supplement your commercially grown seeds with those that can be collected locally from degraded prairie remnants (Table 1). If you wish to collect seeds on private property, you should obtain permission before you do any collecting. Also, please remember that it is illegal to collect seeds or other plant materials on Department of Natural Resources properties or in any Illinois Nature Preserve.

If your objective is to duplicate the presettlement prairie, select seeds of those plants which formerly grew in your part of the state. Illinois has a large variety of prairie types which have certain characteristic plants. Plants of the northern prairies, such as prairie smoke, pasque flower, have no place in your restoration if you live in southern Illinois. Likewise, the plants of the southern prairies do not belong in prairie restorations of the north. A good guide to follow is the natural divisions concept described earlier, and search for seeds within the natural division where your prairie establishment site is located.

For information on the prairie plants that are native to your county, consult "Prairie Plants of Illinois" by the Illinois Department of Natural Resources (Voigt and Mohlenbrock 1979), "Plants of the Chicago Region" by Swink and Wilhelm (1994), "Distribution of Illinois Vascular Plants" by Mohlenbrock and Ladd (1978), or "Flora of Illinois" (Mohlenbrock 1986), or "Plant Species Composition of Wisconsin Prairies" (Henderson 1995).

Never dig any prairie plants from any remnant prairie unless it is about to be destroyed. Most prairie plants can be propagated easily from seed. Leave the plants where they are growing so others can enjoy them in the prairie. Prairies continue to be lost in Illinois due to development, road construction, herbicides, woody invasion, and neglect. Taking plants from these prairie remnants makes these sites less diverse and forever diminishes the experience of visitors.

Seed Storage

Some seeds (such as grasses) lose viability if they are stored dry for a period in excess of one year, but other seeds require exposure to cold temperatures, a process called stratification, before they can germinate. For most prairie plants it is best to dampen the seeds slightly, place them in plastic bags, and put them in cold storage (34F is ideal) immediately after collection where they should remain until planting time. Moist stratification generally results in a higher germination rate for most prairie species.

While in storage, be alert for the growth of fungi which could damage seed. Other seeds, such as pale coneflower, can be stored in a dry condition (Table 1), but better germination is usually achieved through moist stratification. For more specific information on stratification requirements consult Nuzzo (1976) or Rock (1977).

SEEDBED PREPARATION

Conventional Methods

Preparation of the seedbed is one of the most important steps in a prairie restoration. Proper preparation will reduce weeds, facilitate planting, and provide a suitable bed for seed germination. A good seedbed will increase the success of a prairie planting while a poor seedbed will promote failure.

If you are planning a spring planting, begin seedbed preparation in the fall prior to planting the following spring. Small parcels can be prepared with a garden tiller, but larger tracts, one-quarter of an acre or larger, will require the use of large farming implements. Preparation of the site in the fall will damage the root systems of perennial weeds and expose them to freezing temperatures and the dehydrating action of winter winds. In the following spring, the ground should be worked at a shallow depth at least twice to break up clods and eliminate annual weeds.

Large plantings can utilize a disc to cultivate the soil. Final ground preparation immediately prior to planting can be done with a cultipacker, a disc-like farm implement that cultivates only the upper few inches of soil. Once again, a garden tiller can be used on the smaller parcels. Be sure to cultivate only the upper few inches of soil. Deep cultivation exposes more weed seed, eliminates the firm underbase which is necessary for successful prairie establishment and may cause the prairie plant seeds to be planted several inches deep, making it impossible for the seedling to reach the surface.

If the site selected for the prairie planting has a dense sod of fescue, bluegrass or orchard grass, or some other cool-season perennial grass, you should consider the application of a short-lived, non-selective herbicide such as Roundup (glyphosate). A two percent solution of this herbicide is sufficient to kill most grasses and broad-leaved plants. The application of this herbicide should be made when the weeds or grasses are growing rapidly to be most effective, but good results can be obtained as long as the plants are actively growing. If this is not done, portions of the plants remaining above ground will re-establish themselves and create weed problems in the future. As with all herbicides, be sure to read the label carefully.

If you do decide to use an herbicide, use a non-persistent type and allow several days to elapse (one or two days with Roundup) before final soil preparation. A persistent herbicide could damage the prairie plants. By allowing several days to elapse after the application of the herbicide, you are assured of little or no herbicide carry-over.

Conservation Tillage or No Till Planting

The use of no-till drills in prairie establishment is increasing because of the time, reduced erosion, and cost savings of this method. With the no-till procedure it is possible to plant directly into an agricultural field or a site with a dense sod without the plowing, disking and other site preparation of the traditional planting methods. One of the big advantages of no-till planting is that it does not disturb the soil very much, ensuring the firm underbase necessary for successful plantings. Prairie plant seed must be planted within one-half inch of the soil surface. If the seeds are planted deeper, the planting runs the risk of failure because the developing seedlings are not vigorous enough to grow through several inches of soil.

If the planting is going into an agricultural field, first make sure that the soil is free from herbicide carry-over that may be harmful to germinating prairie plants, especially the wildflowers. If the field has high, standing corn stubble, shred the stalks so they will not interfere with the colters or planting devices of the prairie seed drill. Soybean stubble generally does not present a problem for no-till planting.

One of the first tasks to be completed is weed control. If the planting site is an abandoned agricultural field, allow the vegetation to grow to a height of about six inches and then spray it with a non-selective herbicide such as Roundup. A two percent solution will be sufficient to kill most herbaceous plants, including agricultural weeds. If weeds become a problem after the planting, they can be mowed at a height of six to eight inches to reduce the competition with the developing prairie plants. If only parts of the field have concentrations of weeds, mow these areas and leave the rest of the field undisturbed.

PLANTING DATES

Like with home gardening or large scale agriculture, planting dates for prairie seeds are relative. The scheduled planting date should allow for shallow tilling or disking of the plot to eliminate weeds once the soil warms up in the spring. The ideal spring planting date on a statewide basis includes a two-month period from April 15 to June 15, with the earliest planting being made in the southern part of the state. Plantings made after the middle of June run the risk of encountering hot, dry weather which will reduce seed germination and seedling survival.

It is also possible to plant during late September, October or November, thus allowing the seeds to stratify naturally in the soil. If you decide to plant in the fall, be sure to plant late enough so that the seeds germinate the following spring. The freezing temperatures of winter could kill the young seedlings if planted too early.

SEEDING RATES

The seeding rates per acre may vary according to your objectives for the planting. If you want a pure stand of grass, a seeding rate of 8 to 10 pounds per acre should be sufficient for this purpose. **If you desire a mixed stand with numerous prairie wildflowers, reduce the amount of grass seed to 2 to 4 pounds per acre**, particularly the larger grasses such as Indian grass and big bluestem. Increase the amount of wildflower seed until the mixture is about 60% grass and 40% wildflowers by weight (Rock 1977). In addition to reducing seed of the big grasses, also reduce the amount of seed of downy sunflower, false sunflower, drooping yellow coneflower, and new England aster. These plants are very prolific seed producers, and they will crowd out more desirable prairie plants.

By using a seed drill specially made for light fluffy seeds such as those of most prairie plants, it is possible to reduce the amount of seed required to complete the planting. Several commercial drills such as Truax, Miller, Great Plains, Tye and Marliss are made specially for this purpose, and most of these also have no till features.

It is also possible to further reduce the volume of the grass seed by utilizing a process known as "debearding." In this procedure, the seed of big bluestem, Indian grass, or little bluestem is processed in a machine which removes the awns or "beards." The removal of the awn permits the seed to pass through seeding devices more easily. **A comparison of seeding rates for some grasses planted in pure stands is given below. If the seed that you purchase has been debearded, reduce the amount listed by one-fourth.**

For pure grass stands	drill	broadcast
Big Bluestem	8-10 lbs.	10-15 lbs.
Indian Grass	8-10 lbs.	10-15 lbs.
Switchgrass	5-7 lbs.	8-10 lbs.
Little Bluestem	5-10 lbs.	8-10 lbs.

When planted together, the total weight of the grasses should not total more than 6 pounds. This is a recommendation. The ratio of grass to forb seed will often be a matter of personal preference, seed availability and cost. Some individuals prefer a planting where forbs are predominant and conspicuous. The wildflowers have a great aesthetic appeal throughout the growing season.

PLANTING METHODS

The seed of prairie plants may be planted by a variety of methods, including specially made drills, rotary spreaders, or hydraulic mulchers. Hand broadcasting can be utilized on sites less than an acre in size. The important element here is the even dispersal of the seed over the area. Any large scale planting which does not drill the seed into the ground will require the use of a harrow and roller to "set" the seed. This can be accomplished on small plantings by using a rake and a roller attached to a garden tiller. If the conditions are suitable, and the seed viable, it should germinate within two or three weeks.

The use of no till prairie seed drills has increased dramatically in recent years. These drills are made by a number of different manufacturers, and all of them will provide the no till planting that is desired. Using no till planters reduces costs, saves time, and prevents disruption of the soil that could be experienced with the traditional methods of planting. Sites that are to be planted with this method must be free of large, high standing vegetation that will clog the planters on the drill and reduce contact of the planters with the soil, thus reducing the overall effectiveness of the planting effort.

If you plan to use a rotary spreader or drill to plant your prairie seed, make sure that the seed is dry and relatively free of large (three inches or longer) pieces of leaves or stems. If the seed is wet or full of debris, the spreader or drill will not operate properly. Drying and cleaning can be accomplished by placing the seed on a concrete floor. Spread the seed out so it forms a layer about two inches thick. Turn the seed with a rake frequently to aid the drying process. Stems, sticks, and other debris can be removed at this time. If conditions are satisfactory, the seed should be dry within one or two days or less, depending on quantity and drying conditions.

During the first year of the restoration, do not expect to see much growth from the prairie plants. It is during the first year of growth that most prairie plants establish their root systems. Have patience! After two or three years, if survival is good, the prairie plants will be well established. Both Betz (1986) and Schramm (1990) describe the importance of establishing the "prairie matrix," a group of easily established prairie plants that represent the initial stage of succession that eventually leads to the development of a planting much like a native prairie remnant. Schramm (1990) describes four stages that he refers to as the (1) Initial Downgrow Weedy Stage characterized by prairie annuals, (2) Intense Competitive Stand Establishment Stage in which yellow coneflower (*Ratibida pinnata*) or false sunflower (*Heliopsis helianthoides*) are prominent, (3) Closeout Stage in which rattlesnake master (*Eryngium yuccifolium*), compass plant (*Silphium laciniatum*) and prairie dock (*S. terebinthinacium*) are prominent, and (4) a Long-term Adjustment Stage in which the conservative species such as lead plant (*Amorpha canescens*) and prairie dropseed (*Sporobolus heterolepis*) begin to flower. Betz (1986) describes the introduction of second, third and last stage plants. In his last stage, conservative plants like prairie gentian (*Gentiana puberula*), prairie lily (*Lilium philadelphicum*), and Meads's milkweed (*Asclepias meadii*) will be introduced. These conservative prairie plants can be seeded into less diverse areas of the planting by hand sowing or by a prairie seed drill as the planting matures.

The Curtis Prairie at the University of Wisconsin was planted between 1936 and 1941 using the single species concept. In this method, seeds or plants of a single species were placed into plots with the belief that the plants would mature and spread with time. Now, sixty years after the initial planting, certain species such as big bluestem, Indian grass, rattlesnake master, Canada goldenrod, rosin weed, and white false indigo have spread throughout the plantings (Sperry 1994). Established prairies, like remnant prairies, are going to be dynamic communities that will change with time.

There is much that has been learned about recreating prairies, and much more that will be learned in the future. We have much to learn about soils and soil organisms and how they influence prairie reconstruction. It will be important to quantify the results that we observe so that those that follow will know exactly what was done in the planting so they can take advantage of available knowledge.

TRANSPLANTING TECHNIQUES

The seeds of many prairie grasses and forbs may be planted, following stratification, in flats or peat pots for eventual transplantation in the prairie restoration site (Table 2). Previous researchers have used flats filled with a 50/50 mixture of sand and commercial potting mix (Nuzzo 1976). Finely ground sphagnum moss can be dusted on the surface of the planted seedbed to reduce the incidence of damping off fungi. Initial watering of the seedbed should be accomplished by a mist nozzle which will prevent disruption of the seedbed and young seedlings. Once the plants have attained enough growth, individual plants may be transplanted into small (2-1/2 inch diameter) peat pots.

The seedlings should be planted in peat pots in the fall so that they are ready for transplantation in the prairie restoration site in May or early June of the following year. The roots of the plants should be well developed and the shoot (above ground portion of the plant) should have four or five leaves. When planting, make a small hole in the soil large enough to accommodate the biodegradable peat pot. Be sure to place the pot low enough in the hole so that soil can be firmed around the plant to prevent water loss from the sandy potting mixture.

In addition to the transplanting of seedlings, it is also possible to transplant mature one- or two-year old plants which have been grown from seeds in a nursery. These plants can be lifted from the soil by using a shovel or spade. The bare root plants can be packed in sphagnum or wrapped to prevent moisture loss from the roots if planting will be delayed. If you decide to use mature plants to increase diversity in your planting, the following suggestions may prove helpful to you.

1. It is much easier to plant in existing stands after a prescribed burn. You will not have to contend with the dense thatch of grasses and forbs.
2. Select the highest points on the site that are generally free of standing water throughout the year. Place plants that require a dry habitat here. Place others according to their moisture requirements. Be aware that standing water will cause the roots of most prairie plants to rot.
3. Also, select areas that are open and mostly free of the large grasses, big bluestem and Indian grass. Otherwise, these grasses will crowd out the prairie wildflowers. It is possible to create openings in existing stands of grass by using Roundup to kill out grasses or undesirable vegetation. This should be accomplished the year before planting.
4. Make sure the plants are placed deep enough so the buds are covered with one inch of soil. Exposed buds or crowns will be killed by winter temperatures or dehydrated by the summer sun.
5. Make sure that the hole is completely closed around the plant to prevent dehydration of the root system.
6. Some prairie plants initiate growth in early spring (March or April), so it is best to plant in the spring so the plants will be established before the hot, dry temperatures of summer arrive.

Planting can be accomplished by using a shovel, spade, or, if one is available, a tree planting bar. For most plants, it is not necessary to dig a hole. Simply push the blade of your planting tool into the ground to a depth that will accommodate the longest roots of the plant. Alternately push and pull the shovel or spade to widen the cut so the roots will fit into the hole. Insert the plant deep enough so that the buds are one inch below the soil level. In the case of some plants, such as the coneflowers, compass plant, or prairie dock, several individuals may be planted in a single hole. Close the hole by pressing firmly with your foot.

Like other propagation methods, the survival rates vary from one species of prairie plant to another. Excessive moisture and competition from other plants will reduce the success of the planting. Blazing star and rattlesnake master transplant easily and have high survival rates. The use of transplants is very labor intensive. However, their use does have application on small restorations or the enrichment of larger ones.

Based upon several years of observation, it is known that small mammals locate and eat the corms and roots of blazing stars, prairie clovers, and sometimes compass plants and prairie dock. If you plant these in an area having a high density of small mammals, you can expect to lose several of these plants. Fall burning may help with this problem by eliminating cover as depredation seems to be greatest in the winter months.

WEED CONTROL

1. **Late Planting** – In southern Illinois, the ideal time to plant prairie seeds is from April 15 to May 15 while May 15 to June 15 are more ideal for northern Illinois. Shallow cultivation up to planting time will help to eliminate weeds; deep cultivation will expose more weed seed. While this method will help to eliminate weeds, late plantings run the risk of encountering hot, dry weather, which will threaten the success of the entire planting effort (Schramm 1976).
2. **Mowing** – If dense weeds such as giant foxtail develop, mow the plot at a height of 8 to 12 inches with a rotary mower when the weeds reach a height of two to three feet. In the case of sweet clover, mow while the plants are flowering. It is important to use a rotary mower because of its shredding action. The vegetation cut by sickle type mowers could smother the seedlings of the prairie plants. Mow only those parts of the planting that have a weed problem.
3. **Herbicides** – The use of a selective herbicide for broadleaf plants can have application when there are scattered, dense stands of particularly troublesome weeds such as sweet clover. Care should be taken to avoid spraying desirable prairie plants. In the case of sweet clover, it can be sprayed early (March or April) before the prairie plants break dormancy. The sweet clover begins its growth early and it will be one of the few green plants on the restoration site (Schwegman and McClain 1985).

4. **Fire** – Prescribed burning helps to eliminate the alien cool season grasses and weeds. For this reason, a prescribed burn should be planned for March or April of the year following the planting of the prairie seed. Burning in the spring allows the prairie vegetation to remain throughout the winter providing excellent cover for wildlife during this critical period.

In the case of alien, cool season grasses such as bluegrass, late burns (early April) are more beneficial than burns conducted in February or early March. The same applies to sweet clover; early fires seem to stimulate the germination of seeds of this troublesome biennial. Burns conducted at the time of “bud break” may also prove to be helpful in reducing invasion by rough-leaved dogwood or other shrubs.

PRESCRIBED BURNING

Once the prairie restoration becomes established, the site will need only a minimal amount of care. The mature prairie plants will prevent many weeds from becoming established. Fire also helps to maintain the prairie by reducing thatch, weeds, and undesirable woody vegetation. Usually, a burn should be scheduled for the site the first spring following planting. During the establishment phase of the prairie restoration, the site should be burned annually for five or six years. After this time, a prescribed burn every two years is sufficient to maintain the prairie.

Although prescribed burning is an excellent management tool, by its own nature, it is potentially dangerous. Proper planning for manpower and public safety must be accomplished. At a minimum, your planning should include the following items:

- A preliminary check of equipment to ensure proper operation.
- Fire breaks to contain the prescribed burn.
- Source of extra water for fire pumps.
- Adequate manpower and tools.
- The exclusion of persons with heart conditions, respiratory disease, or high blood pressure.
- Protective clothing, such as hard hats and Nomex fire suits, for all people participating in the burn. Man-made fibers such as nylon, polyester or acetate ignite easily and burn rapidly.
- The avoidance of sites near airports and highways due to the smoke and safety hazard.
- Two-way communications during the burn.
- Acceptable weather conditions, including 5-15 mph wind velocities.
- An open burning permit from the Environmental Protection Agency and local agencies, if required.
- Coordination with local officials to determine city or county ordinances regarding fire.
- Weather radios.
- Keep keys in all vehicles in case someone other than the driver has to move the vehicle in an emergency.

It is important to emphasize the necessity of good planning. Prescribed burning is an accepted and highly practical method of establishing, restoring and maintaining prairies, but its use must be carefully planned. The exclusion of persons with known health problems may eliminate a medical emergency during a part of the burn when all individuals are needed to help contain the fire.

When planning your prescribed burn, adequate fire breaks are a necessity. Rake, disc, or plow (if appropriate) a four to eight foot wide fire break around the proposed burn area. You may utilize natural fire breaks (creeks or bluffs) or artificial firebreaks (roads, ditches, or ponds) to contain the fire. Begin the prescribed burn on a day with low velocity winds by setting a backfire (a fire that burns into the prevailing winds) to increase the width of fire breaks, thereby reducing the possibility of the fire crossing the fire lane. Once you have burned out a sufficiently large area, set the headfire (a fire burning with the wind) at the opposite end of the plot (Figure 6). Headfires burn rapidly with high flames while backfires burn slowly with relatively small flames. If you are a novice at prescribed burning, you should obtain the help of an experienced person with your first burn.

Do not select a day in March or April that is hot (70 to 80), windy (20 to 40 mph or higher), and with low humidity (20 to 40 percent). You will be inviting a disaster. To keep abreast of weather conditions, use a pocket sized weather radio. These give continuous, updated weather information which is a necessity for large prescribed burns. These radios will also give information on rainfall, changes in wind direction and velocity, and humidity, enabling advance preparations to be made.

Numerous publications are available on the planning and evaluation of prescribed burns. These include Wright and Bailey (1980), Vogl (1979), Fischer (1978) and Pauly (1982). Useful information on prescribed burning is also present in Mobley (1978). If you are unsure of the proper planning and procedures for prescribed burning, you should consult these references or ask for advice on prescribed burning from the Division of Resource Protection and Stewardship in the Department of Natural Resources, One Natural Resources Way, Springfield, Illinois 62702-1271.





Figure 1. Former range of tallgrass prairie in central North America.
(Reprinted with permission of the National Geographic Society)

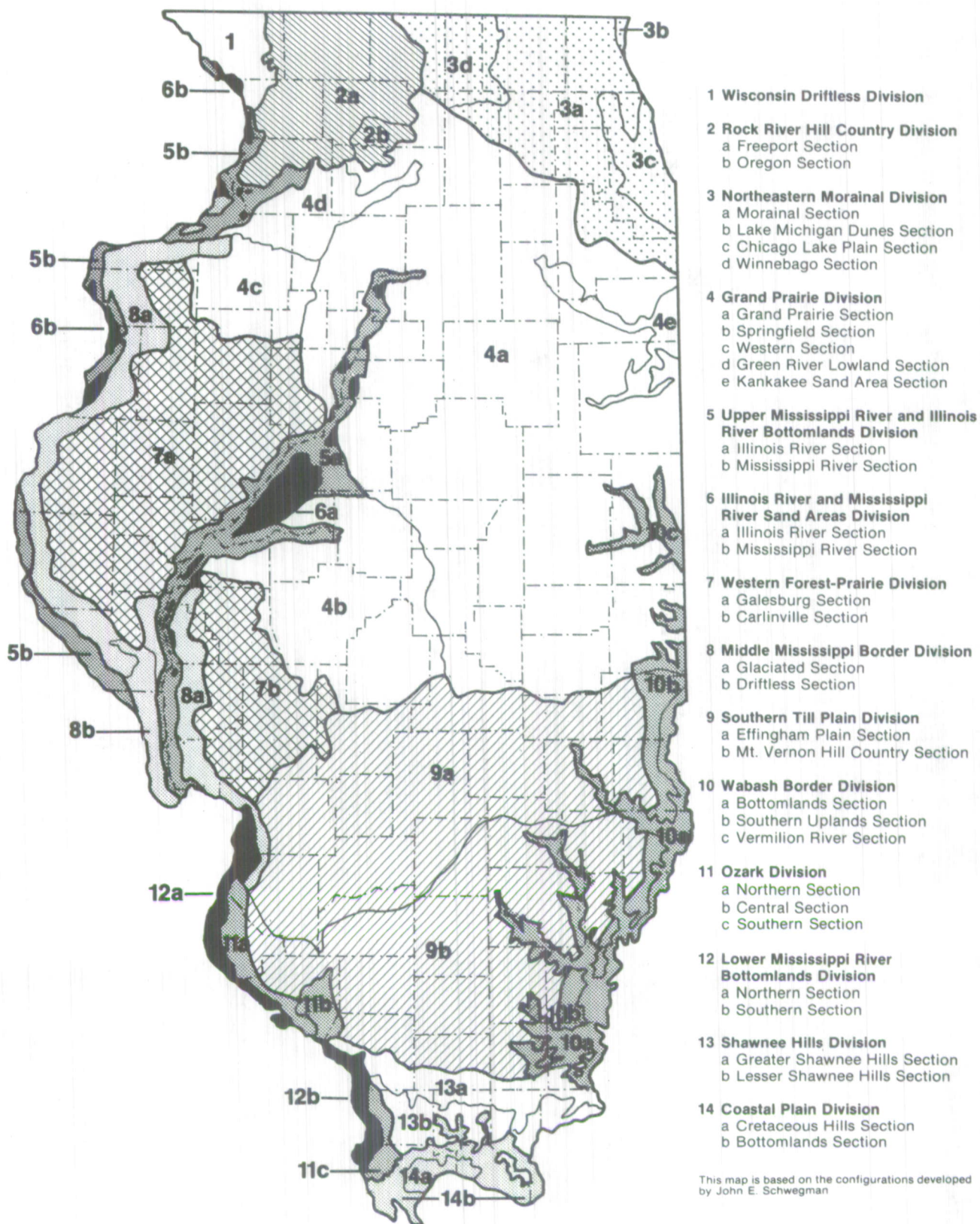


Figure 2. Natural Divisions of Illinois.



Figure 3. Distribution of forest and prairie about 1821 after Anderson (1970).

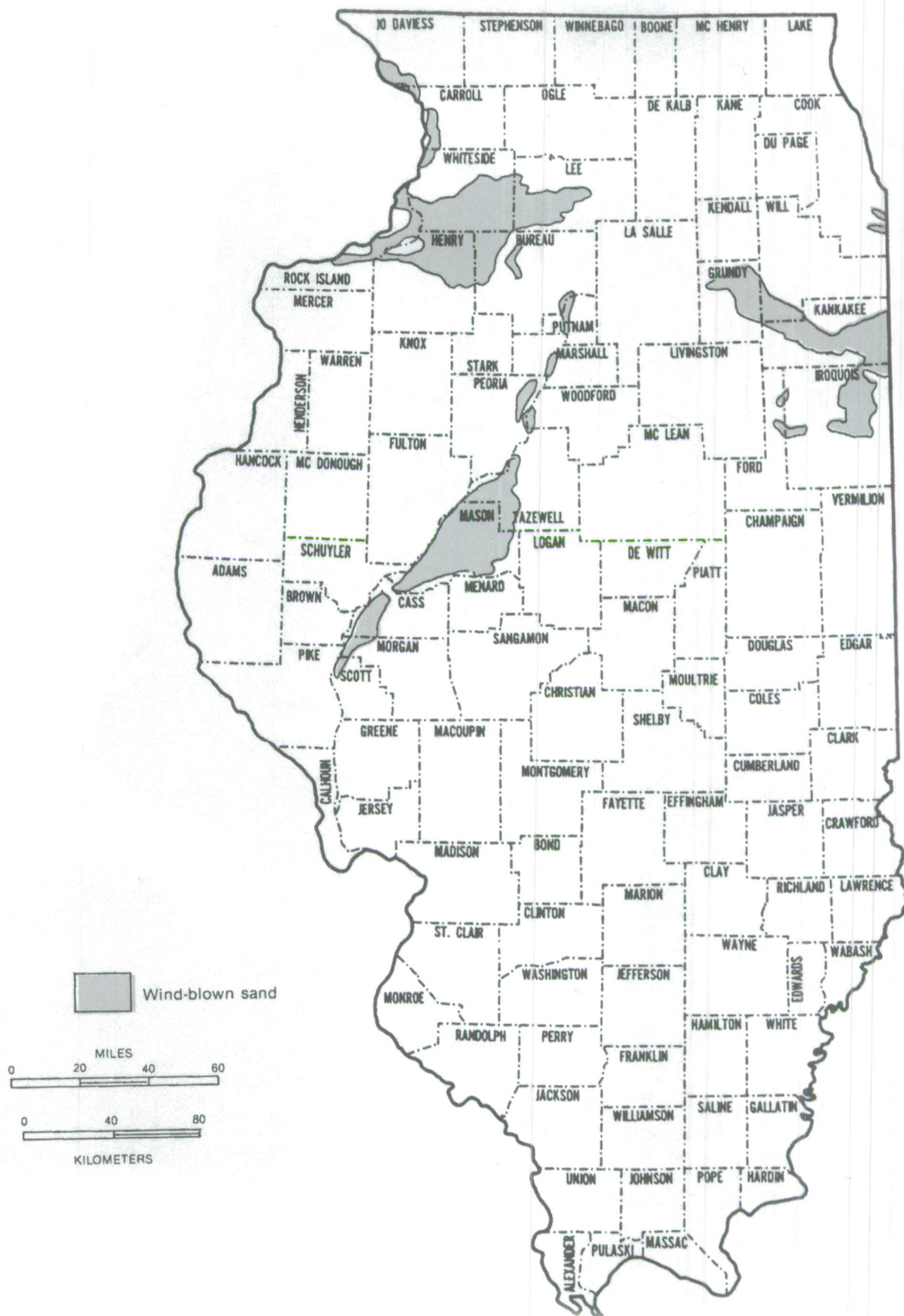


Figure 5. Sand deposits of Illinois.

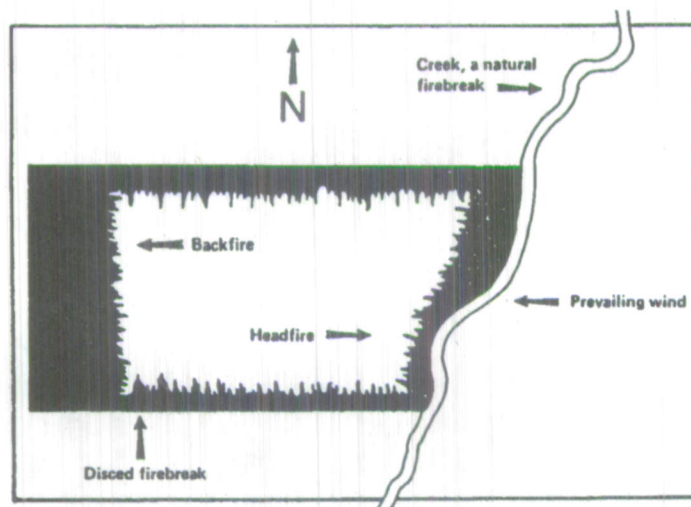
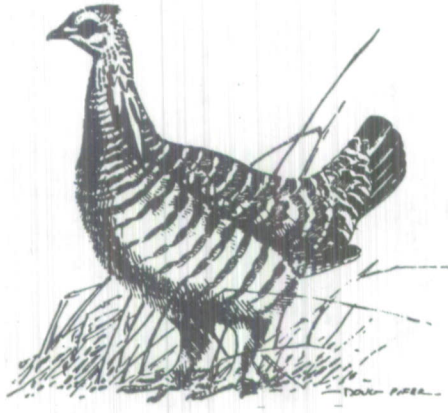


Figure 6. Prescribed burning procedure, showing backfire, headfire, and lateral fires.

Table 1. A Partial Listing of Illinois Prairie Plants by Prairie Type.

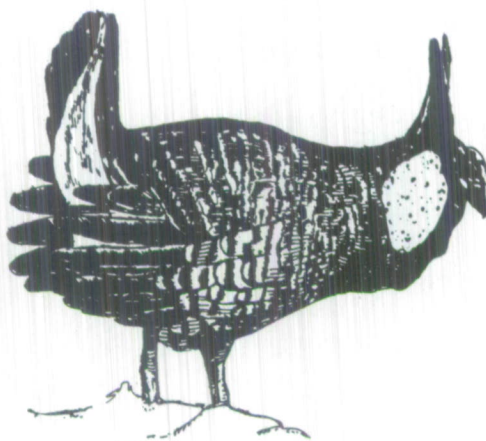
Grasses and Sedges		
Common Name	Scientific Name	Type of Prairie
Big Bluestem	<i>Andropogon gerardi</i>	mesic
Side oats grama	<i>Bouteloua curtipendula</i>	dry
Blue-joint grass	<i>Calamagrostis canadensis</i>	wet
Bristly sedge	<i>Carex comosa</i>	wet
Mead's sedge	<i>Carex meadii</i>	mesic
Tussock sedge	<i>Carex stricta</i>	wet
Canada wild rye	<i>Elymus canadensis</i>	mesic
Little bluestem	<i>Schizachyrium scoparium</i>	dry to mesic
Switchgrass	<i>Panicum virgatum</i>	mesic
Indian Grass	<i>Sorghastrum nutans</i>	mesic
Cord grass	<i>Spartina pectinata</i>	wet
Prairie dropseed	<i>Sporobolus heterolepis</i>	mesic
Forbs		
Prairie milkweed	<i>Asclepias sullivantii</i>	mesic to wet
Butterfly weed	<i>Asclepias tuberosa</i>	dry to mesic
Lead plant	<i>Amorpha canescens</i>	dry to mesic
Heath aster	<i>Aster ericoides</i>	dry to mesic
Smooth aster	<i>Aster laevis</i>	mesic
New England aster	<i>Aster novae-angliae</i>	mesic
White false indigo	<i>Baptisia leucantha</i>	dry to mesic
Cream false indigo	<i>Baptisia leucophaea</i>	dry to mesic
Wild hyacinth	<i>Camassia scilloides</i>	mesic
Lance-leaved coreopsis	<i>Coreopsis lanceolata</i>	dry
Stiff coreopsis	<i>Coreopsis palmata</i>	mesic
White prairie clover	<i>Dalea candida</i>	dry to mesic
Purple prairie clover	<i>Dalea purpurea</i>	dry to mesic
Tall coreopsis	<i>Coreopsis tripteris</i>	mesic
Canada tick trefoil	<i>Desmodium canadense</i>	mesic
Illinois tick trefoil	<i>Desmodium illinoense</i>	mesic
Shooting star	<i>Dodecatheon meadia</i>	mesic
Pale purple coneflower	<i>Echinacea pallida</i>	dry to mesic
Purple coneflower	<i>Echinacea purpurea</i>	dry to mesic
Rattlesnake master	<i>Eryngium yuccifolium</i>	mesic
Western sunflower	<i>Helianthus occidentalis</i>	dry
False sunflower	<i>Heliopsis helianthoides</i>	mesic
Wild iris	<i>Iris shrevei</i>	wet
Prairie bush clover	<i>Lespedeza capitata</i>	dry to mesic
Rough blazing star	<i>Liatris aspera</i>	dry to mesic
Prairie blazing star	<i>Liatris pycnostachya</i>	mesic
Obedient plant	<i>Physostegia virginiana</i>	dry to wet
Prairie lettuce	<i>Prenanthes aspera</i>	dry to mesic
Yellow prairie coneflower	<i>Ratibida pinnata</i>	mesic
Rosin weed	<i>Silphium integrifolium</i>	mesic
Compass plant	<i>Silphium laciniatum</i>	mesic
Prairie dock	<i>Silphium terebinthinaceum</i>	mesic
Blue-eyed grass	<i>Sisyrinchium albidum</i>	dry to mesic

Table 2. Propagation Data For Selected Prairie Plants*

Species	Type and Weeks Of Stratification	Days to FirstGermination	Days to Peak Germination	
Lead Plant	Amorpha canescens	8 dry	6	20
Big Bluestem	Andropogon gerardi	10 dry	5	20
Long-fruited anemone	Anemone cylindrica	none	15	24
Pasque flower	Anemone patens	16 dry	9	17
Heath aster	Aster ericoides	none	8	15
Heath aster	Aster ericoides	8 damp	8	27
Smooth aster	Aster laevis	none	7	20
New England aster	Aster novae-angliae	16 dry	7	12
Silky aster	Aster sericeus	10 dry	3	11
Wild false indigo**	Baptisia leucophaea	6 damp	5	10
Side oats grama	Bouteloua curtipendula	10 dry	5	12
Stiff tickseed	Coreopsis palmata	8 damp	4	14
Purple prairie clover	Dalea purpurea	10 dry	5	12
Canada tickclover	Desmodium canadense	none	14	28
Illinois tickclover	Desmodium illinoense	none	7	15
Boneset	Eupatorium perfoliatum	16 dry	8	14
Downy gentian	Gentiana puberula	12 dry	-	-
Downy gentian	Gentiana puberula	8 damp	18	40
Prairie sunflower	Helianthus rigidus	10 dry	15	49
Alumroot	Heuchera richardsonii	16 dry	15	22
June grass	Koeleria cristata	10 damp	7	19
Prairie bush clover	Lespedeza capitata	10 dry	7	14
Rough blazing star	Liatris aspera	10 dry	6	45
Cylindrical blazing star	Liatris cylindracea	10 dry	8	45
Tall blazing star	Liatris pycnostachya	8 dry	14	30
Prairie hyssop	Pycnanthemum virginianum	16 dry	13	20
Drooping coneflower	Ratibida pinnata	10 dry	5	13
Black-eyed susan	Rudbeckia hirta	10 dry	6	14
Little bluestem	Schizachrium scorparium	10 dry	5	20
Stiff goldenrod	Solidago rigida	10 dry	6	14
Indian grass	Sorghastrum nutans	10 dry	8	19
Prairie dropseed	Sporobolus heterolepis	10 dry	7	25

* Modified from Nuzzo (1976)

** These seeds were also scarified.



PART II: PRAIRIE PLANTS IN LANDSCAPE DESIGN



INTRODUCTION

The use of native Illinois prairie plants in landscape design has grown in popularity as more people have become interested in prairie reconstruction and restoration. The growing interest in prairies can be attributed to many things, including the cultural link to pioneer Illinois, the great variety of prairies and prairie plants, and the opportunity for hands on research and work outdoors. Individuals involved in this type of work believe that they are helping to protect and perpetuate a nearly vanished landscape type. Prairies have been in Illinois for thousands of years where they have survived droughts and storms, but not the onslaught of John Deere's steel plow.

Prairies are a vanishing part of the natural heritage of Illinois. These valuable biological resources tell us what the landscape of Illinois was like during pioneer times. Many reconstructed prairie landscapes of today are intended to recapture parts of the past and preserve it for the future. It seems only logical to do these things in the prairie state of Illinois where the prairie's legacy, the rich dark soils, made Illinois one of the most productive agricultural sites in the world.

However, prairie plants remain virtually unknown to most people because the only prairie that remains is confined to railroad rights-of-ways, fencerows, and pioneer cemeteries. In this modern age, many people are unaccustomed to any type of a landscape planting that differs from the traditional bluegrass lawn or the flower beds with their neat, orderly rows of begonias, geraniums, petunias, or dahlias. Visit prairies during all seasons to see how these plants appear in nature. Learning about prairie plants is the first step in incorporating them into landscape designs.

WHY USE PRAIRIE PLANTS?

Instead of traditional plantings, why not consider the use of native prairie plants in your gardening plans. Prairie plants are well suited to the soils and environment of Illinois. Consider the following before purchasing seed or nursery stock:

- Prairie plants are perennials that do not require replanting every year like many herbaceous ornamentals.
- Prairie plants are nearly free of disease and insects. Bluegrass lawns and ornamentals like roses and other flowers require constant care, including mowing and the application of fungicides, fertilizers, and insecticides.
- Due to their extensive root systems, prairie plants are resistant to drought and dry conditions. Bluegrass, other turf grasses, and most ornamental plants are usually very susceptible to drought, often requiring frequent watering.
- Native prairie shrubs are resistant to cold winter temperatures, unlike cultivated roses and other ornamentals which are killed or severely injured, especially if left unprotected.
- Considerable variation may be found in the heights, leaf sizes and shapes, flower color, and flowering times of prairie plants compared to the monotonous uniformity of traditional plantings.
- A prairie landscape is educational. Few areas of prairie remain in the state, so these plantings help individuals to learn about these plants which caused Illinois to be known as the prairie state.
- Prairie plants attract butterflies and other interesting insects.
- Prairie grasses are spectacular during the fall when they assume their russet, yellow, bronze, and orange colors. Many non native ornamental plants do not have any fall color.
- Prairie plants, including shrubs, have ornamental features other than flowers that make them attractive throughout the year.
- Using prairie plants will reduce noise, conserve gasoline and oil, reduce pollution, and help to reduce accidents associated with lawn mowers.
- Prairie plantings provide valuable habitat for certain insects, birds, and other animals that live in grasslands.
- Prairie plantings can serve as valuable benchmarks for the comparison of soils and soil organisms with sites having other uses.

Many prairie plants, due to their use by Native Americans and pioneers, have an interesting story associated with them. Rattlesnake master was regarded as an antidote for the bite of the prairie rattlesnake (massasauga) by Native Americans who passed this belief on to the pioneers. Compass plant, a member of the sunflower family, received its name because its leaves are held vertically in a north to south plane, supposedly helping pioneers to find their way across the treeless prairies. Many others are reported to have medicinal values while others are known for the fragrances found in their flowers, fruits, stems, and leaves.

THE PRAIRIE GARDEN SITE

Once you have made the decision to start a prairie garden, a planting site needs to be carefully selected and evaluated. It should be an area with good soil that is free of contaminants such as oil or tar, debris such as bricks or limestone rock, and without the potential of herbicide drift, salt spray, or any type of disturbance that will disrupt the prairie planting. The site should permit the graceful combination of the plants with physical factors such as sunlight, wind, and topography. Consider the following when selecting a prairie garden site.

Sunlight: All prairie plants require large amounts of sun and are ideally placed in a location where 75 to 100 percent sunlight will be received. Prairie plants not only require large amounts of sun, remember that sunlight can also be used to enhance the beauty of your planting. Consider how the early morning and late evening rays of the sun will strike your planting. Sunlight at these times can greatly enhance the fall colors of little bluestem or the flowers of prairie roses, shooting stars, or prairie gentians.

Wind: The gentle movements of prairie plants, particularly the grasses, are very aesthetically appealing and soothing to the mind. The pioneers remarked that the wind moving the prairie grasses was much like the waves on an ocean. Designers of prairie gardens should try to create this effect in their plantings and not place them where the wind will be obstructed.

Topography: Variations in the topography of a planting add variety and greater dimension to the planting. Higher elevations may also allow certain plants to be seen in better detail. If the planting site does not have any variations in topography, consider bringing in soil to create gentle knolls.

Existing features: Roads, buildings, fences, utility poles, all need to be considered if they will impact the planting site. Roads detract from the planting by creating an unnatural border. Buildings, fences, and utility poles can cause problems if fire is used in the management of the site.

PREPARATION AND ESTABLISHMENT OF THE PRAIRIE GARDEN

In many ways, the preparation of the site is much like the methods involved in vegetable gardening. If the site has a bluegrass or fescue sod, this should be removed by taking off the sod with a sod removal machine or by using a nonselective herbicide to kill the grass. If you decide to use an herbicide, a 1% solution of Roundup applied as a foliar spray will kill most grasses and broadleaf plants present on the site. Once the sod is dead, it should still be removed because it will interfere with the growth of prairie seedlings and the design of the planting.

Once the sod has been removed, the soil should be cultivated to prepare the site for planting. It is not necessary to cultivate deep into the soil. This procedure may cause problems later because the soil may not be firm enough. Use a tiller and cultivate the upper six to eight inches of soil. The soil should not be cultivated intensively. That would create a loose planting bed for the prairie plants, and could result in poor plant survival because the soil will be too loose around the root systems.

Many sites will be enhanced by the construction of a dirt mound, thereby creating variations in the topography of the site. This can be accomplished by bringing soil in from another part of the property or by purchasing soil. If the soil comes from a site other than your property, make sure that it is very similar to your soil. Also make sure that it does not contain the seeds of aggressive exotic plants such as sweet clover or teasel which could threaten the success of your planting.

Once the soil has been placed on the site, it should be shaped according to the design plans that you have made. The mound should be shaped so that it appears to be a natural part of the planting. This will make the planting much more aesthetically pleasing to you and to other observers of the site.

Some sites, due to construction activities, may have a very tight clay soil which will need some improvements in richness and porosity before planting the prairie garden. Incorporate sand and peat or a good topsoil into these sites using a garden tiller. Work the site until these materials are thoroughly incorporated into the soil. The amount used will depend upon local soil conditions.

PLANNING

Once a site has been selected, the next task should be the actual design of the garden. For this purpose, graph paper works very well to draw and lay out the size, shape, and location of the planting as well as other physical features that will influence the prairie garden such as shrubs, trees, fences, buildings, roads, or ponds (Figures 7 & 8). Also determine the size of the area to be planted in square feet. This will help to determine how many plants are needed for the site and where they should be placed in order to achieve proper balance.

The prairie planting should also be placed at a location away from wooden fences, electrical wiring, gas storage tanks, utility poles, telephone system installations, or other structures that could be harmed by fire if it is used in the management of the site. The wooden structures burn easily, especially utility poles that have been treated with creosote.

Do not use straight lines or blocks in the design of the garden. Straight lines are not found in nature. They will detract from your prairie planting by creating an unnatural border. It is much better to use curves and undulating edges in the prairie planting. Such edges are much more pleasing aesthetically than straight lines. The same concept should also be incorporated into the planting of the prairie plants. Planting in polygons should be adopted instead of rows.

Remember that most prairie grasses are bunch grasses that do not form a sod or turf. They are also warm season plants, meaning that they will grow and flower during the warm summer months unlike Kentucky bluegrass which grows best during the cooler months of the spring and fall. All prairie plants will become larger as they mature, so this needs to be kept in mind as the plant selection takes place.

It is also important to maintain proper balance in the planting. Place tall plants at the sides or back of the garden where they will not obstruct the view of the small ones. If a tall plant is used on one side of the planting, one should be used on the other side to match it.

If the site is going to be managed using prescribed fire, fire breaks should be considered in the planning process. Roads, mowed areas, ponds, or other bodies of water can all be used as firebreaks. It may be necessary to plan for a four to six foot wide firebreak at some location to help contain the fires.

One of the mistakes made in the design and planting of prairie gardens is placing the plants too close together, causing the plants to be crowded and not allowing each plant room to grow and display their graceful forms. Crowded plantings also project a rough, coarse appearance to the visitor of the prairie garden. Individual plants must retain their distinctiveness or gracefully combine with others of the same species in a group.

FEATURES TO CONSIDER

Prairie plantings should communicate nature to the visitor in an aesthetically pleasing manner. This may be done by appealing to the senses of mankind, including sight, smell, touch and hearing. Like prairie remnants, the prairie garden should demonstrate variety and contrast through flower colors, heights, and blooming times. Each species should contribute to the planting by offering a feature not found in other plants or by providing contrast with other plants nearby. It should be a planting that is alive with insects and the gently swaying leaves of the grasses. Consider the following points as you select species:

Plant height: Prairies are plantings for all seasons for prairies are characterized by constant change. During spring months, the shorter prairie plants are in flower. By summer, the mid-height plants are in bloom, and fall brings the tall prairie grasses and the sunflowers. Variation in plant height through the season is then one major difference that needs to be utilized and considered in the ornamental prairie planting.

Blooming time: In all prairie types there is a progression of blooms beginning in April and continuing until September. In planning the prairie garden plants should be selected that will provide continuous color throughout the growing season.

Flower color: The prairie garden will be greatly enhanced by selecting species that produce several different flower colors. Some of the more common colors are white, pink, blue, yellow, and lavender. Red and orange are not nearly as common, yet plants with these flower colors will greatly enhance your planting. There are also white-flowered forms of spiderwort and several of the blazing star species that, when placed with the normal colored form, will provide a striking contrast.

Leaf size and shape: The leaves of prairie dock contrast sharply with the highly dissected leaves of compass plant or the yucca like leaves of rattlesnake master. The leaves of Illinois bundle flower highly dissected. Consider plants with a variety of leaf shapes and sizes in your planting.

Fragrance: The flowers of some prairie plants are extremely fragrant, like the pasture rose or other roses of the prairies. The seeds of prairie clover and northern dropseed are aromatic, as are the leaves of several of the goldenrods and rosinweed. Bee balm, a mint, has especially aromatic leaves. Plants that have these fragrances and pleasing aromas contribute significantly to the total experience of the planting.

Fall color: The most impressive display of fall colors occurs in the grasses, including big and little bluestem, Indian grass, cord grass, and gama grass. Shrubs such as black choke cherry, smooth and winged sumac, and hazelnut all have outstanding fall color. Plants having these features should be included in your planting.

Stem color: Certain shrubs, particularly hazelnut with its gray stems and red osier dogwood with its red stems, have colors that are not easily seen until the dormant season. Yet, these colors will add significantly to the planting during the winter as the grasses will retain much of their color throughout the winter months.

Fruit color and shape: The fruits of black chokeberry are a deep purple while rose fruits are mostly red. Red osier dogwood has white fruits in clusters while the fruits of Illinois bundle flower are like crinkled potato chips. Consider the fruit when selecting plants and include as much variety as possible.

Attractiveness to insects: One common interest of many homeowners is plants that will attract butterflies and other insects. If this is an interest of yours, include the coneflowers, blazing stars, and goldenrods in your planting.

Flower color variations: Some prairie wildflowers show considerable variation in flower color throughout the state. One very good example of this is butterfly weed which varies from a butter-yellow color to deep orange. Some of the ray flowers of pale purple coneflower are nearly white, and white-flowered forms of spiderwort and blazing stars are available. These flower forms will add considerable variety and contrast to your prairie planting.

Leaf textures: The surfaces of the leaves of some prairie plants are rough, like wild quinine, rosin weed, or prairie dock. Others are delicate, like Illinois bundle flower and the prairie clovers. Others have sharp or toothed margins, like rattlesnake master or slough grass. Adding plants with these features will create greater diversity, but they will also enable visually handicapped people to learn about prairie plants.

WHAT TO PLANT?

When you begin your prairie garden one of the first questions that will develop is "What do I plant?" If your planting is small and confined to an area of your yard, use plants instead of seed. Plants or plugs can be placed in the exact spot that you want them. Seeds have the tendency to germinate where they were not planted. By using plants, you are also assured of a vigorous plant that will provide many years of enjoyment. Mature prairie plants are also much easier to distinguish from weed seedlings when they begin to grow than are the seedlings of prairie plants. The material in this text is intended for the backyard gardener.

When deciding what plants to include in your planting, first determine what plants were present in the prairies of your part of the state if your objective is to mimic local prairie types. If your objective is to create other prairie types, consult texts such as those listed at the back of this publication. Include plants that will be in bloom throughout the year, but be sure to include plants that have interesting leaves, fruits, or growth forms. Plants with good fall color will greatly enhance the beauty of your planting. Consult the Appendices in the back of this text for this information.

The few native prairie remnants that we have must be protected and preserved. Plants should never be dug from the remnants unless they are about to be destroyed. Unfortunately, the digging of plants from the wild is becoming more and more common. This practice diminishes the quality of the prairie remnant and prevents others from ever having the opportunity to enjoy the plants in the prairie setting. Many nurseries now sell both seed and plants at reasonable prices.

When planning your prairie garden, do not forget the grasses. Grasses form the matrix of prairies, and they provide contrast with the flowers and growth forms of the prairie wildflowers. Grasses also provide the gentle wind-created movement that is appealing to the viewer. This is one way of communicating nature to visitors of the prairie garden. Two of the best native prairie grasses for landscaping are northern prairie dropseed and little bluestem. Little bluestem also has a silver or glaucous color form which is a strikingly beautiful plant. The growth form of prairie dropseed is reminiscent of a water fountain. When these grasses are used they should be placed in the planting so they can be easily seen and appreciated.

Grasses, goldenrods, asters, coneflowers, cacti, and other prairie plants can be divided by cutting the clump into several separate pieces, making sure that each separate piece has buds and roots. These divisions are then planted like seedlings in the prairie garden. Using this procedure will increase the number of plants and reduce the cost of the project.

WHEN TO PLANT

Prairie plants are mostly warm season plants that do not begin their growth until warm weather arrives. If your planting is small and you have decided to use plants instead of seed, try to plant in April or early May before the hot weather of summer arrives. Although there is little growth above ground, the root systems of prairie plants initiate growth at this time. This is also the time of year that precipitation is most abundant, increasing the chances for survival of the seedlings.

Fall is generally not a good time to place prairie seedlings in the ground. From past experiences, many of these will not survive the winter. Others will heave and the crowns will be exposed, resulting in their death. Straw or some other type of mulch can be used to cover the plants to prevent heaving, subsequent exposure, and death.

PLANTING

It is not necessary to dig a hole to properly plant most of the prairie plants. It is possible to use a spade, shovel, or tree planting bar to make a narrow, deep hole in the soil. Do this by pushing your planting tool into the soil and then rocking or pulling it back and forth to widen the hole. The root system of the prairie plants can then be placed into this hole, making sure that the root crown is about one inch below the soil level. This is very important because root crowns that are exposed will be killed by the winter temperatures or they will fail to grow properly. Also be sure to place all of the roots into the hole before closing it firmly with your foot. If the hole is not closed firmly around the roots, they will dry out and the plant will die.

When the planting is underway, it is best to avoid planting the rootstocks of the mesic species in areas where water stands for long amounts of time. Saturated soil will cause the rootstocks of compass plant, prairie dock, blazing stars and rattlesnake master to rot, resulting in the loss of the plant.

THE PLANTING SITES

The planting designed for your back yard will be viewed from up close, not from a distance. For this reason, spacing is a very important part of the prairie planting. Native prairie remnants are viewed with emphasis on the entire site, not so much on individual plants or a particular group of plants in the prairie. Your backyard planting will be viewed with emphasis placed on individual plants or a group of plants, not the planting in its entirety. Most prairie plants are clump forming species that should be planted about 18 to 24 inches apart. These plants will mature and grow larger with time. Placing the plants closer together will detract from the planting because the features of individual plants will blend and become masked and less noticeable to the visitor to the prairie garden. This is a situation that should be avoided.

THE DRY PRAIRIE PLANTING

In order to create a dry prairie planting, it will often be necessary to bring sand and gravel to the prairie garden site. The gravel should be from non sedimentary rock whose individual pieces are about one inch in diameter. A layer of this gravel, approximately twelve inches thick, should be placed on the prairie garden site to facilitate the rapid drainage that is characteristic of many dry prairies. A layer of non-washed sand, varying in thickness from 12 to 36 inches, should be placed on top of the gravel and shaped to create small knolls and depressions. An area of bare sand could also be left unplanted to simulate a blowout and help create the barren appearance of the dry prairie. Once this is done, it may be necessary to place railroad ties or landscape timbers around the planting to hold the sand in place until the prairie plants have established their root systems.

Due to the great variety of dry prairie types in Illinois, the dry prairie landscape plan has the potential to include many colorful and unusual plant species. Most plants of these prairies are the short to mid height species from the hill and sand prairies as well as prairies found on dolomite in northwestern Illinois. The primary grass in these prairies is little bluestem, and it should be the grass of choice in the dry prairie garden. This grass has superior fall color, and a silver form of this plant exists that will greatly enhance the beauty of the planting throughout the growing season. Other grasses that can be included in the dry prairie planting are side oats grama, hairy grama, reed grass, June grass, and needle grass. Both hairy grama and side oats grama are small plants that should be placed at the front of the planting where they can be easily seen (Appendix 4).

A wide variety of wildflowers or forbs can be included in the dry prairie planting, including cactus, goats rue, prairie clovers, goldenrods, and asters. If cacti like the eastern or plains prickly pear are included in the planting, include a sprawling or decumbent form as well as a form that is erect with long, deflexed spines. Erect forms of the cacti add greatly to the appearance of the planting. Dry prairies, particularly sand prairies, have several short height plants that have very colorful flowers, including cleft phlox, lance-leaved coreopsis, and birds foot violet.

When planting the dry prairie plants, it is important to give individual plants enough space so the entire aspect of the plant can be seen. This is especially true of sand milkweed, goat's rue, hairy grama grass, prickly pear cactus. Dry prairies are usually not as dense as other prairie types, and you should try to duplicate this feature in your planting. The dry prairie planting design (Figure 7) incorporates some of the more common dry sand prairie species. Substitutions can be made in the plants that are listed if other suitable plants are not available. Be sure to keep small plants to the front so they are not obscured by larger plants.

THE MESIC PRAIRIE PLANTING

Mesic, tallgrass prairie was the most common prairie type in Illinois prior to cultivation in the 1800's. The location for a planting of this type should be very sunny and characterized by a rich, black soil free from limestone gravel, oil or tar, or other materials which would diminish the growth of plants and overall success of the planting (Figure 8).

Included in the list of plants for this prairie type are the big prairie grasses, big bluestem and Indian grass, that form the matrix of this prairie. A wide variety of wildflowers are available for this type of planting, including rattlesnake master, prairie dock, compass plant, Culver's root, alum root, and several species of blazing star. Due to the great variety of wildflowers, it is possible to select some very vivid colors, like the orange of prairie lily, the white of Culver's root, and the deep purple of the prairie gentian.

The tall prairie grasses, including big bluestem, Indian grass, and gama grass, all display outstanding fall color. However, one of the most desirable native grasses for landscaping, northern prairie dropseed, does not have much fall color. It does have a beautiful growth form resembling a water fountain when mature, and aromatic seeds. Some of the shrubs of the mesic prairie, namely hazelnut, winged and smooth sumac, and prairie willow, all have attractive stems, and hazelnut and the sumacs have excellent fall color (Appendix 5).

There are also a number of plants that are excellent for attracting butterflies in the mesic prairie planting. These include the blazing stars, Culver's root, wild quinine, and rattlesnake master. If your planting contains these plants, your site will be a favorite place for butterflies, bees, and other insects when these flowers are in bloom.

As with the dry prairie planting, it is best to keep the plants far enough apart that they retain their individual shapes and do not become entwined with adjacent plants. You may also find that some plants, in the absence of competition, will grow tall and lanky, requiring staking.

THE WET PRAIRIE PLANTING

This is a prairie type best placed along the edges of an existing pond or stream (Figure 8). Most backyard plantings can not be accomplished without the excavation of soil to create the depression necessary to hold water to permit the growth of wet prairie species. Such planting sites will add diversity and beauty to the backyard and create habitat for birds and other animals that utilize the community types.

The predominant grass of this prairie type is cord or slough grass, a tall grass with sharp leaf margins, that spreads mostly by rhizomes. The long, pendulous leaves of this grass turn a lemon yellow color in the fall. Another plant of the wet prairies, wild blue iris, will add significantly to the site when in flower in June. Red osier dogwood, with its red stems, and indigo bush, with its purple flowers and orange stamens, will add greatly to the prairie planting. These should be placed at a slightly higher elevation because they will be less tolerant of standing water.

Two of the most colorful wildflowers in the wet prairie planting will be the great blue lobelia and the cardinal flower. These two plants are very spectacular when in bloom. Swamp milkweed will attract a large number of insects, including butterflies and bees.

MAINTENANCE

Compared to some of the commonly used ornamental plants such as roses, dahlias, or begonias, prairie plants are relatively maintenance free. During the establishment phase of the planting, it may be necessary to water the planting and carefully check on the survival of individual plants. Some suggested maintenance procedures are as follows:

Watering of the prairie garden is not necessary except during the establishment phase of the planting. Once the prairie plants have developed their root systems, they will be able to reach sufficient moisture. Excess water will cause the plants to produce a considerable amount of vegetative growth, causing the plant to grow tall and lanky.

Weeds will probably be the primary problem during the establishment of the garden. The most practical method of weed control is hand weeding. This is a slow and laborious process, but most plantings will be small. This process probably will have to be repeated several times during the first few years. Learn to recognize the prairie plants as they begin growth to avoid pulling them up. Waiting for one or two days after a rain before pulling weeds may make this job considerably easier.

Staking will probably be needed for some plants that will grow tall and lanky in the absence of competition. These could include some of the asters, compass plant, goldenrods, and the big grasses. Plants will also grow tall and lanky if they are watered or if fertilizer has been applied to the planting.

Pruning during July will be beneficial to certain plants like New England aster because it will produce a shorter, more compact plant. Other asters may also benefit from the same procedure.

Aggressive species such as sand love grass, oxeye false sunflower, New England aster, and others must be carefully controlled so they do not take over the planting. This problem can be partially corrected by cutting the seed heads off of the plants so no new seed is introduced into the planting.

Thatch removal needs to be completed on these prairie gardens every year. If local regulations will permit the use of prescribed fire and it can be accomplished safely, this is the most efficient method to remove the dead tops. If fire can't be used, the dead tops should be cut off with a weed eater and raked off of the planting. This should be done during the dormant season before the prairie plants initiate growth.

Pests and diseases will not be a major problem in managing the prairie garden because most prairie plants are free of pests and diseases. Spraying may also kill desirable insects.

Mulching with cypress wood or bark will help to prevent frost heaving during winter, help conserve moisture, and reduce competition with weeds. Mulching with wood or bark will also greatly enhance the appearance of the planting during the growing season, helping to diminish the "weed" perceptual problem. Do not burn your mulch up during a prescribed burn.

Exotic species such as sweet clover or Kentucky bluegrass can invade the planting and seriously diminish the vigor of the plants and their general appearance. Infestations of these plants and others can be controlled by hand pulling or the use of a good hand tool such as a hoe or cultivator.

Herbicides that are safe to handle and environmentally friendly can be used to treat problem perennial weeds. The applications should be done with a sponge type applicator to avoid injury to desirable plants.

Rodents may cause problems in the planting by eating the fleshy roots and corms of blazing stars, compass plant, prairie dock, or prairie clovers during the winter months. Keeping the thatch off of the planting through prescribed burning or cutting will help, but be vigilant of signs of small mammal activity.

Fertilizers usually will not be used in the prairie garden. Applications of fertilizers often cause the plants to grow tall and lanky, or produce a considerable amount of growth which detracts from the planting.

It is a good idea to have experienced help with you if are planning your first prescribed burn. Burning is the most practical method of maintaining a prairie garden, but it may not be the most suitable method for your site for other reasons. The direction of the prevailing wind or proximity to neighboring buildings may restrict burning on the site. Remember that the fuels, particularly the grasses, will be highly volatile at this time and will burn quickly with a lot of heat. Refer to the section on prescribed burning in the prairie restoration part of this manual.

If prescribed burning is not an option available for use in your prairie garden, cutting or mowing may prove to be a satisfactory substitute. One of the best tools to use in cutting the dead vegetation on the prairie garden is a weed eater. These power driven tools cut the vegetation quickly and efficiently. It can then be raked off of the site and used in a compost pile. Although a power mower may be used to cut the vegetation, it is not as good at cutting as a weed eater due to the height of the taller prairie grasses and wildflowers.

The indiscriminate use of herbicides in the prairie garden is discouraged because the possibility of injury to desirable plants is too great a risk to take. It is quite true that very specific herbicides have been developed that will control certain weeds and not harm prairie grasses and some wildflowers, but these herbicides may be best used for large sites where expensive landscape size plants have not been used.

SOME MISTAKES MADE IN PRAIRIE LANDSCAPING

There are many reasons why prairie landscapes are not attractive and well accepted. Some of the more common mistakes made in these plantings are:

1. Not including enough individuals of one species to achieve the desired effect. One coneflower or one lily will probably not be enough to produce the color that you want.
2. Planting too close will create a landscape that is crowded. This is a perceptual problem that will cause many of the visitors to the garden to regard the plants as weeds. Space the plants far enough apart so most sides of the plant and the area around it can be seen.
3. Mixing tall and short plants will create a rough appearance, resulting in the perceptual problem mentioned above. Strive for proper balance by gradually increasing plant height from front to the back of the planting.
4. Not taking the time to eliminate weeds such as foxtail, lamb's quarters, or other weeds will really diminish acceptance of the planting.
5. Poor species selection could result in a planting that has very little color or color for only a short time. Such plantings are not interesting to visitors.

The use of prairie plants in landscape design is, at present, a little used concept. Although some prairie plants such as butterfly weed, purple coneflower, and some blazing stars are sold as ornamentals, they are planted with non-native plants in the garden. Perhaps there is a belief that plants from other countries are better than our native species. Perhaps prairie plants disappeared so quickly and completely that few people are now familiar with them. However, there is an increasing interest in the use of these plants. Those that do use these plants find their use to be a very rewarding experience.

GLOSSARY

- annual** - a plant which lives for one year.
- backfire** - a fire burning into the wind.
- biennial** - a plant that lives for two years.
- biome** - a community of living organisms of a single major ecological region.
- debearding** - the process of removing awns or "beards" from grass seeds.
- dormancy** - a period of inactivity in plants or plant seeds usually associated with winter.
- epoch** - a period of time characterized by certain notable events.
- fauna** - the animals of a particular site or region.
- flammable** - easily burned or ignited.
- flora** - the plants of a certain site or region.
- forb** - broad-leaved plant.
- fungicide** - a chemical or pesticide used to control fungi.
- genetic** - referring to heredity or variation within plants and animals.
- germination** - to sprout or begin to grow.
- glaciation** - the moving, grinding action of glaciers.
- headfire** - a fire burning with the wind.
- herbicide carry-over** - the persistence of herbicides in soil, perhaps resulting in damage the following year.
- hybridize** - to "mix" two different plant or animal species, producing genetically different offspring.
- inoculant** - in this instance, nitrogen fixing bacteria.
- inoculation** - the process of placing nitrogen fixing bacteria on legume seeds.
- Kankakee Torrent** - a tremendous flood resulting from the melting of glaciers near the present site of Kankakee about 12,000 years ago.
- legume** - a member of the bean family.
- moraine** - a mass of earth, sand, and rocks left by a glacier.
- mulch** - peat, leaves, straw, or other material used to prevent frost heaving or the freezing of plants.
- nitrogen fixation** - the process of producing nitrogen in the roots of legumes by certain bacteria.
- nonselective herbicide** - a pesticide that controls both grasses and broadleaf plants.
- nonpersistent herbicide** - an herbicide that has a very short or relatively short soil life.
- perennial** - a woody or herbaceous plant which lives for more than two years.
- persistent herbicide** - an herbicide that remains in the soil for a long time, i.e., up to a year or more.
- phenology** - the study of periodic biological phenomena, such as flowering in plants.
- pinnate** - a term used to describe the feather-like arrangement of leaflets or veins.
- propagation** - in plants, the production of more plants through seeds or vegetative division.
- savanna** - a grassland characterized by scattered trees without canopy closure.
- scarification** - the process of scratching or weakening seeds having thick coats.
- seasonal aspect** - phenology, or the study of seasonal phenomena in plants such as flowering.
- selective herbicide** - a chemical or pesticide that controls either grasses or broadleaf plants.
- stratification** - the process of subjecting seeds to cold temperatures.
- thatch** - the dead tops of prairie grasses and wildflowers.
- viability** - in plants, the ability of seeds to germinate.
- Xerothermic period** - a period of unusually hot and dry weather which occurred after the last glaciation about 9,000 years ago.



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APPENDIX 1: HISTORIC PRAIRIES OF ILLINOIS

- Allen's Prairie** in Greene County, twelve miles northeast of Carrollton was a large prairie with timber on the water courses.
- Allison's Prairie** in Lawrence County five miles northeast of Lawrenceville was ten miles long and five miles wide. The eastern part near Wabash County contained a large wet land known as Purgatory Swamp, but most of it was dry.
- Apple Creek Prairie** in Greene County, north of Apple Creek, was ten miles long and two to four miles wide.
- Arm of the Grand Prairie** in Jefferson County was eight miles northeast of Mr. Vernon. The soil was tolerably good.
- Arrington Prairie** in Wayne and Clay Counties was once known for the presence of bison bones.
- Barney's Prairie** in Wabash County, seven miles north of Mt. Carmel, was a good tract of land.
- Bear Prairie** in Wayne County was a small tract of land five miles east of Fairfield.
- Belle City Prairie** was a small prairie in the northwestern corner of Hamilton County. This place name remains to this day.
- Bellview Prairie** in Calhoun County was a rich, dry prairie at the foot of the bluffs in the Illinois River bottom that was six miles long and nearly a mile wide.
- Big Mound Prairie** in Wayne County, five miles west of Fairfield, was three miles in extent with thin soil and an undulating surface. A large mound gave this prairie its name.
- Big Prairie** in White County, between the Little and Big Wabash Rivers, was three miles in diameter with a sandy soil.
- Big Prairie** was in Monroe County
- Big Prairie** in St. Clair County in American Bottoms was settled before 1800. Two men burned to death in a prairie fire at this site.
- Birk's Prairie** in Edwards County, about 4,000 acres in size, was long and narrow with several salt licks. The ground was worn away near these sites due to the activity of animals.
- Boltinghouse Prairie** in Edwards County south of Albion was four miles long and three miles wide with a dry undulating surface. Mr. Boltinghouse was killed in a skirmish with Native Americans. It was known as the English Prairie at later dates.
- Bon Pas Prairie** in Edwards County four miles northeast of Albion was about two miles in diameter.
- Bonus Prairie** in Boone County was settled in 1836.
- Boyd's Prairie** was in Bureau County.
- Brown's Prairie** in the corner of Macoupin and Green Counties twelve miles north of Alton between Wood River and the Piasa, having rich, dry soil.
- Brushy Prairie** in Wayne County eleven miles east of Fairfield on the east side of the Little Wabash River.
- Buckeye Prairie** in Christian County was settled by people from the Buckeye State of Ohio.
- Buckheart Prairie** in Fulton County northeast of Lewistown was six to eight miles in extent and joins with Canton Prairie.
- Buck Prairie** in Edwards County six miles northeast of Albion was two and one-half miles wide.
- Buckhorn Prairie** in Morgan County, six miles south of Jacksonville, was rich, level, and wet.

Bullard's Prairie, sometimes called Gardner's Prairie, was sixteen miles west of Lawrenceville in Lawrence County, and was eight to ten miles long and two miles wide with second rate soil.

Bull's Eye Prairie in Mason County was an extensive wet prairie in the Sangamon River bottom.

Burnt Prairie in the northwest part of White County was two miles in diameter. This place name remains to this day.

Burnt Prairie in Edwards County four miles northwest of Albion was six miles long and two miles wide and interspersed with small groves. Mr. Clark erected a wind-driven mill to grind grain at this site.

Bush Prairie was in Edwards County.

Canton Prairie in Fulton County began near the Spoon River and ran north, forming the dividing line for the waters that flow into the Spoon River on the west and the Illinois River to the east. At Canton it was two to three miles wide, rich, and undulating.

Casey's Prairie in Jefferson County near Mt. Vernon was five miles long and two miles wide with a tolerably level surface and second rate soil.

Center Prairie was in Bureau County.

Center Prairie in Knox County was full of potholes that attracted waterfowl.

Chenowith Prairie was in Bureau County.

Christy's Prairie in Lawrence County, ten miles west of Lawrenceville, had rolling topography and average soil.

Clay Prairie in Clark County was west of Union Prairie and eight miles southwest of Darwin.

Cold Prairie in St. Clair County in the American Bottoms was on the road from St. Louis to Belleville.

Conant Prairie in Perry County west of Pinkneyville was less than seven miles long.

Conner's Prairie was in Clay County.

Conner's Prairie was in Marion County

Cotton Hill Prairie was in Sangamon County between South Fork and Horse Creek twelve miles south of Springfield.

Cox's Prairie in Jackson County northeast of Brownsville had a rolling surface.

Crows Prairie in Putnam County was so named due to the abundance of crows at this site.

Decker's Prairie in Wabash County twelve miles northeast of Mt. Carmel was small with an undulating, second rate surface.

Diamond Grove Prairie in Morgan County south of Jacksonville was four miles long with rich soil and a dry, undulating surface.

Dolson's Prairie in the west side of Clark County was six miles wide and twice as long was considerably wet with a thin, clay soil.

Donnehue's Prairie was in Marion County.

Drennan's Prairie in Sangamon County was located near Panther Creek between Auburn and Chatham.

Dutch Prairie was in the southwest part of St. Clair County.

East Long Prairie was in Shiloh Township in Jefferson County. There was an exposure of sandstone in the middle of the prairie.

Eaton Prairie in Perry County was about three miles west of Pinckneyville.

Edmonson's Prairie in McDonough County, six miles southwest of Macomb, was one to two miles wide and ten miles long.

Eight Mile Prairie in Franklin County eighteen miles southwest of Frankfort was level and one to two miles in diameter.

Elk Prairie in Perry County between the Little Muddy and Beaucoup Creeks was five miles long with a dry, level surface and second rate soil.

English Prairie in Edwards County was initially called Boltinghouse Prairie. This site was used extensively for hay.

Estes Prairie in Franklin County fourteen miles north of Frankfort had a level, dry surface.

Flat Prairie in Randolph County was 20 miles east of Kaskaskia.

Fork Prairie in Bond County between the forks of Shoal Creek north of Greenville had a gently undulating surface.

Forked Prairie was in Sangamon County east of the South Fork.

Four Mile Prairie in Perry County adjacent to Pinckneyville was seven miles long and four miles wide with an elevated, dry, undulating surface.

Fourteen Mile Prairie in Effingham County received its name from the distance along the National Road. It had a level surface and some dry land.

Fox Prairie was in Richland County. Ornithologist Robert Ridgeway often visited this site in the late 1800s.

French Creek Prairie in Edwards County southeast of Albion was between the Little Wabash River and Bonpas Creek.

Frizzel Prairie was in Franklin County.

Froggy Prairie was located on Honey Creek in Adams County. It was a wet prairie named due to the abundance of frogs.

Garden Prairie in Sangamon County between Richland and Rock Creeks fourteen miles northwest of Springfield was two miles wide and eight miles long with a level, rich surface. It was beautiful when the prairie was in bloom.

German Prairie was northeast of Springfield in Sangamon County.

Goose Nest Prairie was in Coles County. This was the site where the family of Abraham Lincoln settled after moving to Illinois from Indiana.

Granger's Prairie in the northwest part of Adams County was three miles long and over a mile wide with very rich soil.

Grand Prairie in the east and central counties was between the Mississippi and the Wabash Rivers.

Grand Prairie in Crawford County between the Embarrass and Wabash Rivers ran north into Clark and Edgar Counties. It was narrow and wet.

Grand Prairie in Clinton County east of the Okaw River had a hard pan under the prairie.

Grand Coti Prairie in Washington County was on a ridge between the Kaskaskia River and Beaucoup Creek.

Gun Prairie in Jefferson County south of Mt. Vernon was two miles long and a mile wide.

Hancock Prairie in Adams County was a nearly level prairie that began above Bear Creek and continued north for about fifteen miles into Warren County.

Hargrave's Prairie in Wayne County near Fairfield was seven miles long and two miles wide with thin soil.

Hart's Prairie was a small prairie in Morgan County south of Waverly that was named after Rev. William A. Hart. Its namesake, Hart's Prairie Church, remains to this day.

Hawkins Prairie in Greene County was on the south side of Macoupin Creek about nine miles south of Carrolton.

Hennepin Prairie was in Henry County.

Herald's Prairie was in Gallatin County.

Herron's Prairie was in the southwestern part of Franklin County.

Herrington's Prairie, eleven miles northwest of Fairfield in Wayne County, was eight miles wide and two to four miles wide with a rolling surface and second rate soil.

High Prairie in St. Clair County was a beautiful prairie eight miles south of Belleville.

Hogg Prairie in Hamilton County a few miles west of McLeansboro was two miles in diameter and level and wet. It was named after Samuel Hogg.

Horse Prairie in Randolph County has a rich, undulating surface. It received its name from the presence of wild horses.

Horse Prairie was in Jefferson County.

Illinois Prairie in Calhoun County, formerly called Wolf Prairie, began at the mouth of the Illinois River and continued north for twenty miles along the bottoms. It was over a mile wide.

Indian Prairie in Wayne County ten miles northwest of Fairfield had soil of an indifferent quality.

Jersey Prairie in Morgan County was a beautiful prairie ten miles north of Jacksonville.

Jordan's Prairie in Jefferson County six miles north of Mt. Vernon was five miles wide and over a mile wide with second rate soil.

Knight's Prairie was west of McLeansboro in Hamilton County.

Knob Prairie in Franklin County was a low, wet prairie fifteen miles northwest of Frankfort.

Lamotte Prairie in Crawford County was a sandy, rich site that was eight miles long and one to five miles wide.

LaSalle Prairie in Peoria County adjoining Lake Peoria was a sandy, rich site above the highest floods that was ten miles long and three to four miles wide.

Levitt's or Leavitt's Prairie was in Clay County.

Lemarde Prairie in Wayne County, seven miles northwest of Fairfield, was six miles long and three miles wide and of inferior quality.

Lick Prairie was in the southern part of Wabash County. Its name suggests the presence of a salt or mineral lick.

Little Prairie in Washington County was in the midst of an elevated post oak flat.

Little Prairie in Edwards County was made well known by the writings of Morris Birbeck and George Flower.

Little Mount Prairie in Wayne County three miles southwest of Fairfield was two miles long and a mile wide. A small high mound in this prairie contains the graves of Native Americans.

Long Prairie in Wabash County thirteen miles northwest of Mt. Carmel had an undulating, second rate surface.

Long Prairie in Edwards County north of Albion was nine miles long and over a mile wide and interspersed with groves of timber.

Long Prairie was in Boone County.

Long Prairie in Clay County, a branch of Twelve Mile Prairie, was eight to ten miles long and thirteen miles wide with level, poor soil.

Long Prairie in Jefferson County five miles west of Mt. Vernon was four miles long and over a mile wide.

Looking Glass Prairie in St. Clair County, a large, rich, undulating, beautiful prairie lying between Silver and Sugar Creeks, extended twenty miles north into Madison County. Its beauty did not impress English author Charles Dickens. It is likely that this prairie was named after the Indian Chief Looking Glass.

Lorton's Prairie in Greene County on the north side of Apple Creek had excellent land and good timber.

Lost Grove Prairie was in Bureau County.

Lost Prairie in Perry County seven miles west of Pinckneyville was three mile long and over a mile wide with rich soil and a high undulating surface.

Loup Prairie was in St. Clair County.

Luken's Prairie was in the south side of Lawrence County.

Macon County Prairie north of Decatur in Macon County between the north fork of the Sangamon and Salt Creek was level and wet in some areas and dry and undulating in others.

Macoupin Prairie in Greene County between the Piasau and Macoupin Creek had a moderately undulating, rich surface.

Manning's Prairie was in Jackson County.

Marshall's Prairie north of Cox's Prairie fourteen miles northeast of Brownsville in Jackson County had a rich, undulating surface.

Mason's Prairie was in the southwest part of Lawrence County twenty miles from Lawrenceville.

McCall's Prairie was in Robinson Township in Crawford County.

Mill's Prairie in Edwards County eleven miles northeast of Albion was four miles long and over two miles wide.

Moore's Prairie in Jefferson County six to twelve miles southeast of Mt. Vernon was eight miles long and two to three miles wide.

Moore's Prairie in St. Clair County five miles east of Bellville was five miles long with tolerably good soil.

Morse Prairie in Jefferson County contained mineral springs.

Mud Prairie in Morgan County was approximately six miles southwest of Waverly.

Mud Prairie was located in the southeast part of St. Clair County.

Mud Prairie, located on Mud Creek in Washington and Perry Counties fourteen miles northeast of Pinckneyville, was level and rather wet.

Mud Prairie in Wayne County eight miles northwest of Fairfield was low and wet.

New Design Prairie was a small three to four mile-wide grassland in Monroe County.

Nine Mile Prairie in Perry County ten miles east of Pinckneyville was nine miles in diameter.

North Arm Prairie in Edgar County six miles east of Paris runs east to the Indiana line and west to join with the Grand Prairie. It was three miles wide and consists of good land.

North Prairie was in Bureau County.

North Prairie was in Clinton County. North Prairie Church remains to this day.

North Prairie in Morgan County twelve miles northeast of Jacksonville on the south side of Mauveterre Creek had a rich, dry undulating surface.

Oblong Prairie in Edwards County was one mile wide and had very fertile soil.

Oblong Prairie in Crawford County occupied ten sections and was so named because of its peculiar shape. The name was later applied to the town which continues to bear the name of the prairie..

Ogle's Prairie in St. Clair County five miles north of Belleville was a beautiful, undulating prairie five miles long and one to two miles wide.

Old Pearl Prairie in Pike County was located north of the present village of Pearl.

Ox Bow Prairie in Putnam County, ten miles south of Hennepin, was a rich prairie five miles long and one to two miles wide that was shaped like an ox bow and surrounded by timber.

Parker's Prairie in Clark County was a large, level prairie with wet, second rate soil.

Phelp's Prairie in Franklin County on the waters of Crab Orchard Creek twelve miles south of Frankfort was good, somewhat rolling land.

Philo Prairie in Williamson County, twelve miles south of Frankfort, had a gently undulating, fertile surface.

Plum Creek Prairie in St. Clair County and part of Randolph County was three miles wide and ten miles long with good soil.

Poor Prairie in Franklin County twelve miles south of Frankfort was level, wet land.

Prairie du Long was in the south part of St. Clair County.

Prairie du Rond was a small, three to four mile wide prairie in Monroe County.

Pratt's Prairie in the northeastern part of Greene County was fifteen miles northwest of Carrolton.

Ramsey Prairie was in Clay County.

Rattan's Prairie in Madison County, seven miles northwest of Edwardsville, was level and wet in places.

Red Lick Prairie was in Marion County. It received its name from an exposure of red limestone above the head of Bee Branch. The soil near the limestone contained salt or minerals.

Ridge Prairie in Madison County started near Edwardsville and extended south into St. Clair County. It was the dividing ridge for the waters that fall into the Mississippi on the west and the Kaskaskia River on the east.

Rock Creek Prairie was in Fayette County

Rollin's Prairie in Franklin County north of Frankfort was six miles long and four miles wide with level good soil.

Round Prairie in the northeast part of Schuyler County on William's Creek twenty miles from Rushville had a rich dry, undulating surface that was surrounded by timber

Round Prairie was in LeRoy Township in Boone county.

Round Prairie in Wabash County twelve miles northeast of Mt. Carmel was four miles in diameter with a fertile surface.

Round Prairie in Bond County six miles west of Greenville was one to two miles in diameter with a rich, undulating surface.

Round Prairie in Perry County on the east side of Beaucoup Creek eight miles from Pinkneyville was seven miles long and one to two miles wide.

Round Prairie was in Sangamon County between the forks of Sugar Creek and the south fork of the Sangamon River seven miles southeast of Springfield.

Round Prairie in Marshall County was six miles wide.

Salt Prairie in Calhoun County, between the bluffs and Salt Prairie Slough, was six miles long and less than a mile wide. A large saline was located at the north end of the prairie.

Sand Prairie in Tazewell County four miles south of Pekin had a rich, sandy soil.

Santa Fe Prairie in Clinton County was a wet prairie of coarse grass on a big bend of the Kaskaskia River.

Seven Mile Prairie in White County was seven miles west of Carmi.

Saratoga Prairie was in Saratoga Township in Marshall County.

Shipley's Prairie was a small prairie in Wayne County five miles south of Fairfield.

Shoal Creek Prairie was an extensive prairie west of Shoal Creek in Clinton, Bond, and Montgomery Counties. It was slightly rolling with an average width of eight miles.

Six's Prairie in Schuyler County, seventeen miles south of Rushville, was a rich, undulating prairie ten miles long and three miles wide that was surrounded by timber. Mt. Sterling was located in this prairie.

Six Mile Prairie in the American Bottoms in the southwestern part of Madison County was surrounded by a heavy body of timber.

Six Mile Prairie in Perry County nine miles southwest of Pinkneyville was nine miles long and six miles wide with good, level soil.

Six Mile Prairie was in Franklin County. A short distance from the prairie was a large expanse of barrens.

Six Mile Prairie was in Jackson County.

Smith's Prairie was in Fulton County near Lewiston. Many people regarded it as the most beautiful prairie they had ever seen.

Smooth Prairie in Madison County in the forks of Wood River eight miles east of Alton was three miles long and two miles wide, level, and wet.

South Prairie in Morgan County was on the south side of Walnut Creek.

Squaw Prairie in Boone County was ten sections in size, level, and fertile.

String Prairie in Greene County between Macoupin and Apple Creeks four miles west of Carrolton was fifteen miles long and one to three miles wide, rich, and level.

Strawn's Prairie in Putnam County north of Magnolia was named after Jeremiah Strawn.

Stum's Prairie was in Edwards County south of Albion.

Sugar Prairie was in Richland County.

Sweet's Prairie was a level, wet prairie in the south part of Morgan County three miles west of Manchester.

Swett's Prairie in Madison County was four miles northeast of Edwardsville.

Three Mile Prairie in Washington County eight miles south of Nashville had an undulating surface.

Tom's Prairie in Wayne County was six miles northeast of Fairfield on the Elm River.

Totten's Prairie in Fulton County, seven miles west of Lewiston, was three miles wide and ten miles long.

Town Prairie was in Jefferson County.

Town Mount Prairie in Franklin County was near the Big Muddy River.

Turney's Prairie in Wayne County was a small prairie with good soil eight miles south of Fairfield.

Twelve Mile Prairie in Effingham County west of the Little Wabash River was level and wet in places. The National Road crossed it in Effingham County.

Twelve Mile Prairie in St. Clair County was an undulating prairie with good soil. The Native American name for this site was Tay-mar-waus.

Union Prairie in southeastern Clark County was five miles long and three miles wide.

Union Prairie in Schuyler County was four miles west of Rushville.

Village Prairie in Edwards County was two miles north of Albion. A small stream called the Village ran through it to the Little Wabash.

Virgennes Prairie was in Jackson County.

Walnut Hill Prairie in Marion and Jefferson Counties was four miles long, three miles wide, and flat and wet.

Walnut Prairie in Clark County near the Wabash River was five miles long and two miles wide with level, rich, sandy soil. The prairie received its name from the numerous walnut trees around the periphery of the prairie.

Webb's Prairie in Franklin County fifteen miles east of Frankfort was good land.

West Long Prairie was in Shiloh Township in Jefferson County.

Willow Prairie in Crawford County in Oblong Township occupied ten sections.

Wood's Prairie in Wabash County ten miles from Mt. Carmel was good prairie.

Wright's Prairie in Franklin County twelve miles south of Frankfort had an undulating surface.



APPENDIX 2. SOURCES OF NATIVE ILLINOIS PRAIRIE PLANT SEEDS AND PUBLICATIONS ON PRAIRIES

Allendan Seed
1966 175th Ln
Winterset, IA 50273-8500
Phone: (515) 462-1241
Fax: (515) 462-4084

Services: seeds, plants, consulting, custom planting, landscaping

Bluestem Prairie Nursery
RR 2
Hillsboro, IL 62049
Phone: (217) 532-6344
Services: Plants, seeds, consulting

Country Road Greenhouses, Inc.
19561 Twombly
Rochelle, Illinois 61068
Phone: (815) 384-3311
Fax: (815) 384-5015
Services: Wholesale for plants only

Dr. Peter Schramm
Prairie Restorations
766 Bateman St.
Galesburg, IL 61491
Phone: (309) 343-2608
Services: seeds, consulting, custom planting

Earthskin Nursery
9331 N CR 3800E
Mason City, IL 62664
Phone: (217) 482-3524
Services: consulting, local ecotype seeds and wholesale and retail seedlings of prairie species of the Grand Prairie

Enders Greenhouse
104 Enders Drive
Cherry Valley, IL 61016
Phone: (815) 332-5255
Fax: (815) 968-2941
Services: Plants, seeds, site evaluations, consulting

Frey Prairie Seeds
Dennis Frey
Box 104, Route 2
Dahlgran, IL 62828
Phone: (618) 648-2216
Services: consulting, grass seeds, and forb seeds from the southern till plan of Illinois

Henry Fromm
Fromm-Huff Farm
10998 Salisbury Road
Pleasant Plains, IL 62677
Phone: (217) 626-1583 or 626-1690
Services: Wholesale for plants, retail in quantities 100+

Genesis Nursery
23200 Hurd Rd.
Tampico, IL 61283
Phone: (815)438-2220
Fax: (815)438-2222
Services: Seeds, plants and consulting

Jet Hall
R.R. 1, Box 81
Walnut, IL 61376-9717
Phone: (815)379-2629 (leave message)
Services: Seeds

Lafayette Home Nursery, Inc.
P.O. Box 1A
Lafayette, IL 61449
Phone (309) 995-3311
Fax: (309) 995-3909
Services: Plants, seeds, consulting, custom planting

PecaSugar Nursery
Kathy and Dave Winters
13002 Harrison Rd.
P. O. Box 22
Shirland, IL 61079
Phone: (815) 629-2165
Website: www.pecasugar.com

Prairie Restorations, Inc.
31922 128th Street
PO Box 327
Princeton, MN 55371
Phone: (612) 389-4342
Services: native prairie grass, forb, and wetland seed and rootstock

The Prairie Patch
R.R. 1, Box 41
Niantic, Illinois 62551
Phone: (217) 668-2409
Services: Plants, seed, consulting, custom planting

The Natural Garden
38W443 Highway 64
St. Charles, Illinois 60175
Phone: (630) 584-0150
Fax: (630) 584-0185
Services: seeds, plants, consulting, custom planting

OTHER NEARBY SEED AND PLANT SOURCES

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Appendix 3: Ornamental Values of Selected Prairie Forbs.

Species	Prairie Type	Height (feet)	Flower Color	Flowering Time	Ornamental Values
<i>Amorpha canescens</i> (lead plant)	Dry to Mesic Prairies	1 to 3	Deep purple with yellow stamens	June	Deep purple flowers with yellow stamens; pinnately compound, silvery leaves give plant a gray cast; semi-erect, open growth form; attracts insects
<i>Anemone canadensis</i> (thimble weed)	Wet	1 to 3	White	May-June	Eye-catching white flowers; thimble-shaped seed head
<i>Asclepias amplexicaulis</i> (sand milkweed)	Dry sand prairie	1 to 2	Greenish-purple	May-June	Sprawling growth habit, convoluted grayish-green leaves, pink to red stems & leaf veins; seed pods often held vertically; attracts insects
<i>Asclepias incarnata</i> (swamp milkweed)	Mesic to Wet	2 to 4	Rose	June-August	Rose-colored flowers; aggressive seeder; attracts butterflies
<i>Asclepias purpurea</i> (Purple milkweed)	Mesic	2 to 3	Purple	May-June	Vibrant purple flowers, attracts insects
<i>Asclepias sullivantii</i> (Sullivant's milkweed)	Mesic	2 to 4	Purple	July-Sept.	Glabrous leaves with prominent pinnate veins; attracts insects
<i>Asclepias tuberosa</i> (butterfly weed)	Dry to Mesic	1 to 3	Yellow to deep orange	June-July	Plants hairy; butter- yellow to deep orange flowers, semi-erect, open growth form, attracts insects
<i>Aster azureus</i> (sky-blue aster)	Dry	1 to 3	Blue	Sept.-Oct.	Sky-blue colored flowers; rough textured leaves; attracts insects

Species	Prairie Type	Height (feet)	Flower Color	Flowering Time	Ornamental Values
<i>Aster novae-angliae</i> (New England Aster)	Mesic	2 to 4	lavender to deep purple	September-October	Deep purple or lavender flower heads with yellow centers; rough, aromatic leaves, heart-shaped at base; attracts insects, aggressive seeder
<i>Aster sericeus</i> (silky aster)	Dry	1 to 2	Lavender to blue	August-October	Beautiful lavender flowers and dense silver hairs on leaves, attracts insects
<i>Baptisia leucantha</i> (white false indigo)	Mesic	2 to 4	White		Long spike of pea-like, white flowers and fruits held high above leaves; ascending branches; plants have grayish-green cast
<i>Baptisia leucophaea</i> (cream false indigo)	Mesic	1 to 2	Cream	May	Plants silvery hairy, short, dense and rounded; clusters of drooping, cream-colored flowers; grayish, dark green cast, attracts bees and other insects.
<i>Cacalia tuberosa</i> (Indian plantain)	Dry to Mesic	2 to 3	Cream	May-June	White-striped, bean-sized fruits; oval-shaped, strongly veined leaves; grooved stem.
<i>Callirhoe triangulata</i> (poppy mallow)	Dry	1 to 3	Purple	June-September	Very attractive purple flowers; round, wheel-shaped fruit; long blooming period; triangular, rough leaves.
<i>Camassia scilloides</i> (wild hyacinth)	Mesic	1 to 2	Pale blue to white	May	Long, linear, smooth leaves; spike of pale blue, star-like flowers.
<i>Coreopsis lanceolata</i> (lance-leaved coreopsis)	Dry	1 to 2	Yellow	May	Brilliant yellow flowers, linear leaves.
<i>Coreopsis palmata</i> (stiff tickseed)	Dry to Mesic	2 to 3	Yellow	June	Brilliant yellow flowers and stiff dissected leaves resembling bird's feet; attracts butterflies.

Species	Prairie Type	Height (feet)	Flower Color	Flowering Time	Ornamental Values
<i>Dalea candida</i> (white prairie clover)	Dry to mesic	1 to 3	white	June-July	Aromatic seeds, small, fern-like leaves, open growth form, terminal, thimble-shaped flower heads; attracts insects.
<i>Dalea purpurea</i> (purple prairie clover)	Dry to mesic	1 to 3	Purple	June-July	Aromatic seeds, small, fern-like leaves, terminal, thimble-like flower heads; attracts insects.
<i>Desmanthus illinoensis</i> (Illinois bundle flower)	Dry to mesic	1 to 3	White	July-August	Delicate, small, white flowers on long stalk; lacy; fern-like leaves; fruits resemble crinkled potato chips; plants with light green cast; attracts insects
<i>Dodecatheon meadia</i> (shooting star)	Mesic	1 to 2	White or Pink	April-May	Cluster of pendulous, star-like flowers; glabrous, basal leaves.
<i>Echinacea pallida</i> (pale purple coneflower)	Dry to Mesic	1 to 3	Pale Purple	May-June	Flower head with drooping ray flowers; attractive seed heads; rough, mostly basal leaves; attracts butterflies and bees.
<i>Echinacea purpurea</i> (purple coneflower)	Mesic	1 to 3	Purple	June-July	Multi-flowered; attractive seed heads; long blooming time; leaves rough; attracts butterflies and bees.
<i>Eryngium yuccifolium</i> (rattlesnake master)	Mesic	2 to 3	White	July-Aug.	Stiff, yucca-like leaves with spines on margins; ball-shaped seed heads on ascending branches; grayish, light green cast; attracts insects.
<i>Gentiana puberula</i> (downy gentian)	Mesic	1 to 2	Purple	September-October	Eye-catching deep purple blooms open in morning.

Species	Prairie Type	Height (feet)	Flower Color	Flowering Time	Ornamental Values
<i>Geum triflorum</i> (prairie smoke)	Mesic	1 foot	Deep Rose	April-June	Feathery appendages of fruits, resemble small feather dusters.
<i>Helianthus occidentalis</i> (western sunflower)	Dry	1 to 3 feet	Yellow	August-October	Rough, hairy, basal leaves; long, leafless flower stalk, golden yellow flowers.
<i>Heuchera richardsonii</i> (alum root)	Mesic	1 to 2	Greenish White	May-June	Deep green, geranium-like basal leaves; small, bell-like, green flowers on tall stalks.
<i>Heliopsis helianthoides</i> (false sunflower)	Mesic	2 to 4	Yellow	June-July	Attractive yellow flowers, rough leaves, tends to be very aggressive, long blooming period, attracts insects.
<i>Iris shrevei</i> (wild iris)	Wet	2 to 3	Deep blue with yellow centers	May	Attractive orchid-like flowers, watermelon-like fruits, sword-shaped foliage.
<i>Liatris aspera</i> (blazing star)	Dry to Mesic	2 to 4	Lavender	August-September	Very attractive flower cluster; blooming from top to bottom; Contrast with white color forms; attracts butterflies, bees.
<i>Liatris cylindracea</i> (dwarf blazing star)	Dry	1 to 3	Purple	July-August	Bright purple flowers; attracts butterflies and bees.
<i>Liatris pycnostachya</i> (prairie blazing star)	Mesic	2 to 4	Lavender	July-August	Eye-catching, dense flower cluster; blooms from top down; contrast with white color forms; attracts butterflies, bees.
<i>Lilium michiganense</i> (lily)	Mesic	2 to 3	Reddish orange	June-August	Vibrant orange flowers; smooth, whorled leaves.

Species	Prairie Type	Height (feet)	Flower Color	Flowering Time	Ornamental Values
<i>Lithospermum canescens</i> (hairy pucoon)	Mesic	1 to 2	Yellow	April-May	Attractive trumpet-shaped, yellow flowers; difficult to grow.
<i>Lithospermum carolinense</i> (Carolina pucoon)	Dry	1 to 2	Yellow	April-May	Trumpet-shaped, brilliant, golden yellow flowers, dark green, glossy foliage; difficult to grow.
<i>Monarda fistulosa</i> (wild bergamont)	Dry	2 to 4	Lavender to purplish	July-Sept.	Head of lavender flowers, entire plant very aromatic, aggressive, attracts insects.
<i>Monarda punctata</i> (spotted mint)	Dry sand prairies	1 to 3	White	June-Sept.	Long, white bracts remain through growing season, entire plant very aromatic.
<i>Opuntia humisfusa</i> (eastern prickly pear)	Dry	1 to 2	Yellow with red center	June	Waxy, butter-yellow flowers, rose-colored fruits; sprawling growth habit, scattered white spines on upper half of pad; attracts bees.
<i>Opuntia macrorhiza</i> (plains prickly pear)	Dry	1 to 2	Yellow with red center	June-July	Erect forms; waxy, butter-yellow flowers; rose-colored fruits; multiple, deflexed white spines on upper half of pads; attracts bees.
<i>Parthenium integrifolium</i> (wild quinine)	Mesic	2 to 3	White	June-July	Unusual white flowers resembling small cauliflower heads; long blooming period; aromatic, rough leaves.
<i>Ratibida pinnata</i> (drooping yellow cone-flower)	Mesic	2 to 4	Yellow	June	Flower heads with drooping, bright yellow ray flowers; aromatic seeds; attracts bees and butterflies.

Species	Prairie Type	Height (feet)	Flower Color	Flowering Time	Ornamental Values
<i>Rudbeckia hirta</i> (black eyed susan)	Mesic	2 to 3	Yellow	May-June	Bright yellow ray flowers radiating out from dark center; biennial.
<i>Silphium laciniatum</i> (compass plant)	Mesic	4 to 8	Yellow	July-August	Large, highly-lobed, rough leaves held vertically in north to south plane, yellow flower heads on tall stalk; aromatic, resinous seeds, leaves, and stems.
<i>Silphium terebinthinaceum</i> (prairie dock)	Mesic	6 to 8	Yellow	July-August	Large, rough basal leaves and very tall, nearly leafless flower stalks; aromatic seeds, leaves, and stems.
<i>Silphium integrifolium</i> (rosin weed)	Mesic	6 to 8	Yellow	July-August	Large yellow flower heads; rough, resinous, aromatic leaves, seeds, and stems.
<i>Solidago ptarmicoides</i>	Dry	1 to 2	White	August-September	White flowers, attracts bees.
<i>Solidago nemoralis</i> (showy goldenrod)	Dry	1 to 3	Yellow	August-September	Reflexed branches with yellow flowers; aromatic leaves.
<i>Solidago rigida</i> (rigid goldenrod)	Dry to Mesic	2 to 4	Yellow	August-September	Clusters of bright yellow flowers; rough, aromatic leaves.
<i>Tephrosia virginiana</i> (goats rue)	Dry	1 to 2	Cream and Pink	May	Sweet pea-like, cream and deep pink flowers; tends to defoliate later in the season; attracts bees and butterflies.
<i>Thalictrum dasycarpum</i> (meadow rue)	Wet	3 to 6	White	June-July	Wispy, delicate flowers; purple stems.

Species	Prairie Type	Height (feet)	Flower Color	Flowering Time	Ornamental Values
<i>Tradescantia ohiensis</i> (spiderwort)	Mesic	2 to 3	Blue	April-May	Blue flowers with yellow stamens and translucent stamen hairs; opens in early morning, closes by noon; contrast blue and white color forms.
<i>Vernonia fasciculata</i> (ironweed)	Mesic	3 to 4	Rose	July-August	Purple clusters of flowers; attracts bees and butterflies.
<i>Veronicastrum virginicum</i> (Culver's root)	Mesic	2 to 3	White	June	Graceful candlebra-like flower heads; whorls of sword-shaped, dark green leaves; plant several together to achieve desired results.
<i>Viola pedata</i> (birds foot violet)	Dry	3 to 4 inches	White and Purple	April-May	Nodding, rich violet blue flowers; delicate, highly dissected leaves.
<i>Zizia aurea</i> (golden alexander)	Mesic	1 to 2	Yellow	April-May	Vibrant golden-yellow flowers in diffuse cluster; glossy, dark-green leaves.
<i>Zizia aptera</i> (golden alexander)	Mesic	1 to 2	Yellow	April-May	Vibrant, golden-yellow flowers on diffuse umbel; glossy leaves.

Appendix 4: Ornamental values of selected prairie grasses.

Species	Prairie Type	Height (feet)	Flowering Time	Ornamental Values
<i>Andropogon gerardi</i> * (big bluestem)	Mesic	6 to 8	August-September	Flower stalks have blue, salmon, and orange stems; nice yellow and bronze fall colors; flower cluster resembles turkey foot. Aggressive
<i>Bouteloua curtipendula</i> (side-oats grama)	Dry	2 to 3	August-September	Flowers have orange anthers; one-sided seed heads; nice red fall color.
<i>Bouteloua hirsuta</i> (hairy grama)	Dry	1 to 2	May-June	One-sided seed heads resembling an eyebrow; held horizontally on tall stalks
<i>Eragrostis trichodes</i> * (sand love grass)	Dry	2 to 3	August-September	Excellent orange and russet fall colors; open, attractive seed head, may be aggressive in plantings.
<i>Koeleria cristata</i> (June grass)	Dry to Mesic	1 to 2	June	Attractive cool season grass; narrow, dense, straw-colored seed heads; twisted lower leaves.
<i>Panicum virgatum</i> * (switch grass)	Wet	3 to 4	August-September	Handsome plume-like seed head; good russet fall color; tends to be very aggressive.
<i>Schizachyrium scoparium</i> (little bluestem)	Dry	3 to 4	August-September	Excellent russet fall color persists through winter; fluffy white seeds on arching stems; silver form provides excellent color and contrast.

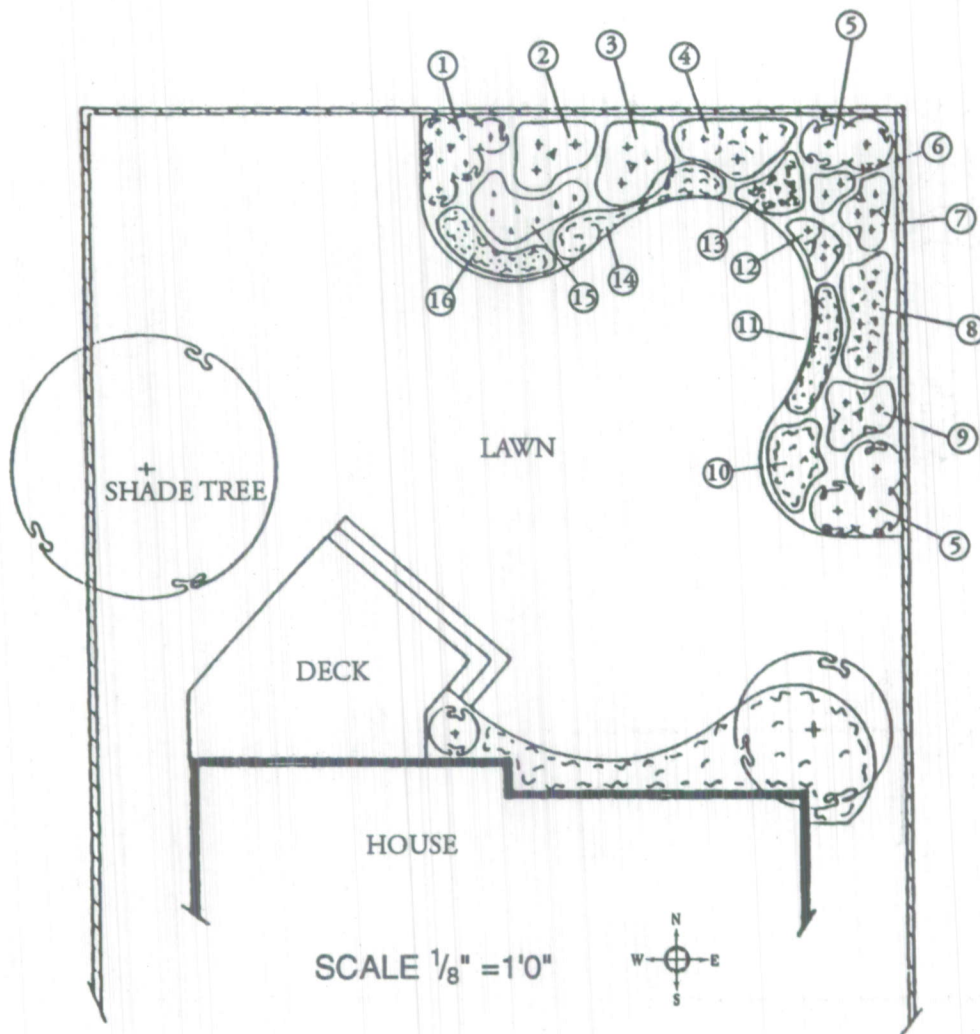
Species	Prairie Type	Height (feet)	Flowering Time	Ornamental Values
<i>Sorghastrum nutans</i> * (Indian grass)	Mesic	4 to 6	August-September	Glossy, plume-like seed heads; tends to be very aggressive; good fall color.
<i>Spartina pectinata</i> * (cord grass)	Wet	4 to 6	August-September	Open seed cluster; individual seed heads one-sided & resemble a comb; lemon-yellow to amber fall color.
<i>Sporobolus heterolepis</i> * (northern dropseed)	Mesic	2 to 3	August-September	Very decorative grass with narrow, drooping leaves reminiscent of a water fountain; aromatic seeds; one of best native grasses for landscaping.
<i>Tripsacum dactyloides</i> * (gama grass)	Wet	3 to 5	June-July	Wide drooping leaves; very unusual flower & seed heads that resemble corn; nice amber fall color.

*All of these grasses have long, narrow, pendulous leaves for aesthetic effects of wind.

Appendix 5: Ornamental values of selected prairie shrubs.

Species	Prairie Type	Flower Color	Flowering Time	Ornamental Values
<i>Aronia melanocarpa</i> (black chokeberry)	Dry	White	June	White flowers, dark purple berries, intense red fall color.
<i>Amorpha fruticosa</i> (indigo bush)	Wet	Purple	June	Clusters of bell-shaped flowers with orange stamens; multiple stems.
<i>Ceanothus americanus</i> (New Jersey tea)	mesic to dry	White	June to July	Rounded, cushion-like shape, gray-green cast; delicate flowers in clusters; attracts insects; clusters of three-lobed fruits
<i>Cornus stolonifera</i> (red osier dogwood)	Wet	White	June-July	White fruit; young stems have red bark throughout the year.
<i>Corylus virginiana</i> (hazel nut)	Mesic	Green	October	Pendulous catkins persist through winter; gray, arching stems; good yellow, orange, and red fall colors, seeds eaten by small mammals.
<i>Rhus aromatica</i> (aromatic sumac)	Dry	Green	May	Low, compact growth form and fleshy, reddish fruits; good yellow and red fall colors.
<i>Rhus copallinum</i> (winged sumac)	Dry to mesic	Greenish-white	May-June	Open growth form; clusters of reddish fruits; glossy leaves; deep scarlet fall color.
<i>Rhus glabra</i> (smooth sumac)	Dry to mesic	Greenish-white	May-June	Open growth form; clusters of reddish fruits; brilliant red fall color; light tan bark.
<i>Rosa carolina</i> (pasture rose)	Dry to mesic	Pink	May	Very fragrant flowers and red fruit that remains into winter.

Species	Prairie Type	Flower Color	Flowering Time	Ornamental Values
<i>Rosa setigera</i> (prairie rose)	Mesic	Deep Rose	May-June	Very attractive flowers; red fruits; pinnately compound leaves.
<i>Salix humilis</i> (prairie willow)	Mesic	White	April	Low, compact growth form; gray catkins; multiple stems with yellow bark; leaves silver underneath.



PLANT LIST

- 1 Aromatic Sumac—*Rhus aromatica*
- 2 Side-Oats Grama—*Bouteloua curtipedula*
- 3 Rigid Goldenrod—*Solidago rigida*
- 4 Indian Grass—*Sorghastrum nutans*
- 5 Black Chokeberry—*Aronia melanocarpa*
- 6 Poppy Mallow—*Callirhoe triangulata*
- 7 Sand Love Grass—*Eragrostis trichodes*
- 8 Western Sunflower—*Heliathus occidentalis*
- 9 Little Bluestem—*Schizachyrium scoparium*
- 10 Lance-Leaved Coreopsis—*Coreopsis lanceolata*
- 11 Lead Plant—*Amorpha canescens*
- 12 Dwarf Blazing Star—*Liatris cylindracea*
- 13 Silky Aster—*Aster sericeus*
- 14 Birds Foot Violet—*Viola pedata*
- 15 Goats Rue—*Tephrosia virginiana*
- 16 Plains Prickly Pear—*Opuntia macrorhiza*

Figure 7. Dry prairie border.

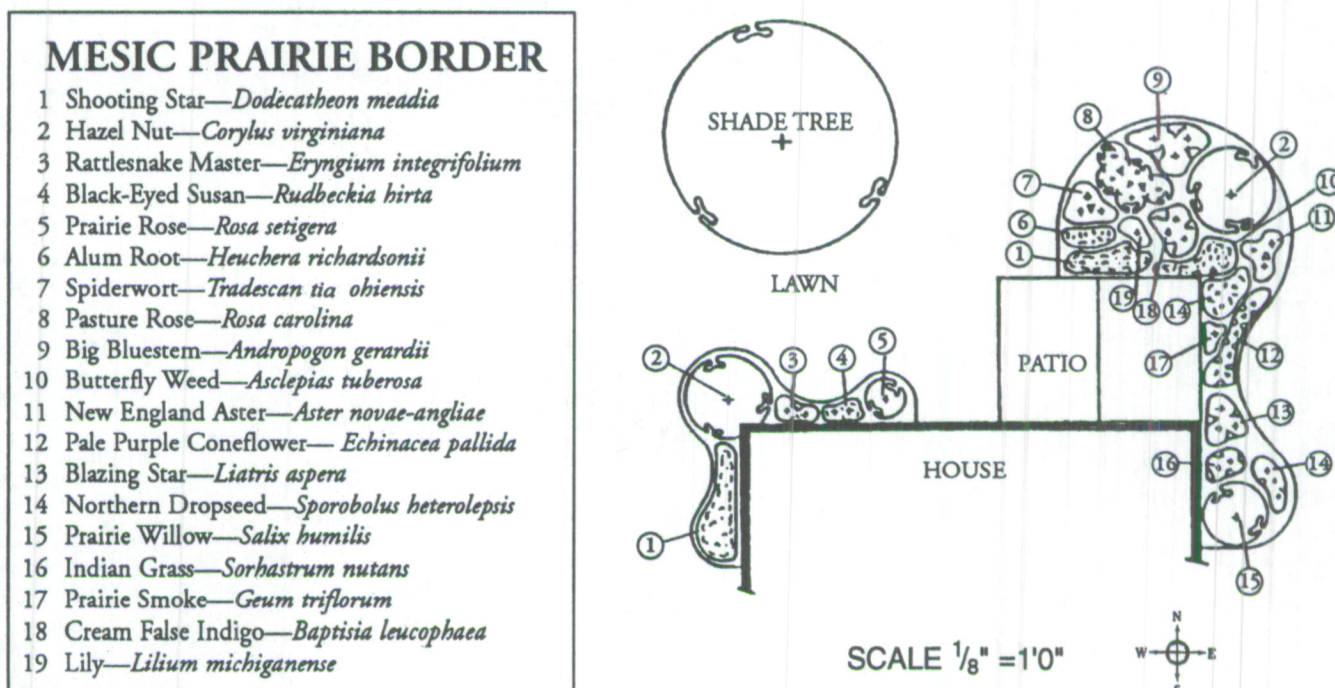
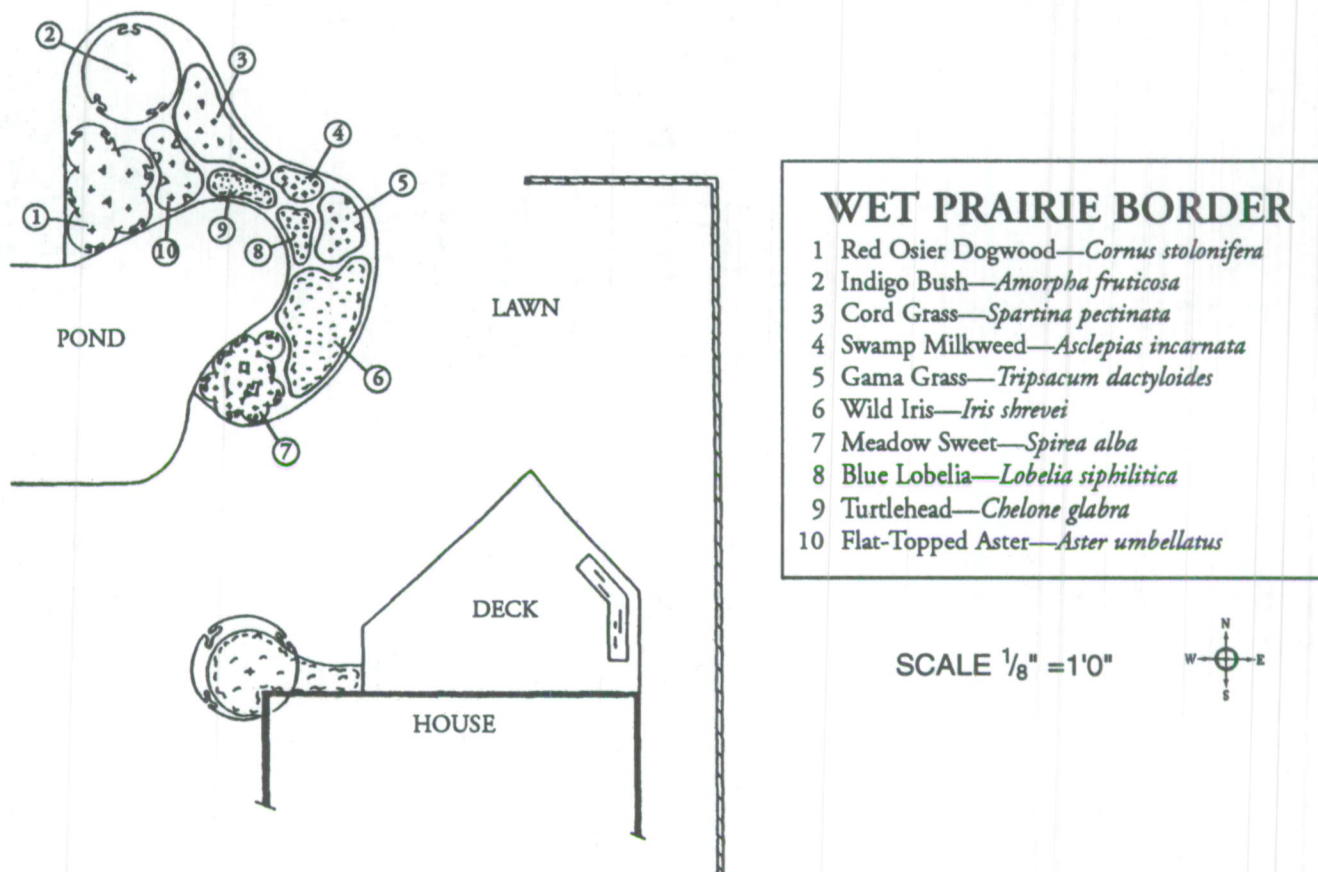


Figure 8. Mesic and wet prairie borders.

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618/435-8138
618/439-7376 fax

District 45

Vacant
Administrator
Region XXXIV Office
Districts 195 - 200
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 46

Vacant
Administrator
Region XXXV Office
Districts 201 - 206
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 47

Vacant
Administrator
Region XXXVI Office
Districts 207 - 212
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 48

Vacant
Administrator
Region XXXVII Office
Districts 213 - 218
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 49

Vacant
Administrator
Region XXXVIII Office
Districts 219 - 224
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 50

Vacant
Administrator
Region XXXIX Office
Districts 225 - 230
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 51

Vacant
Administrator
Region XL Office
Districts 231 - 236
11731 State Highway 37
Benton, IL 62812
618/435-8138
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District 52

Vacant
Administrator
Region XLI Office
Districts 237 - 242
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 53

Vacant
Administrator
Region XLII Office
Districts 243 - 248
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 54

Vacant
Administrator
Region XLIII Office
Districts 249 - 254
11731 State Highway 37
Benton, IL 62812
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District 55

Vacant
Administrator
Region XLIV Office
Districts 255 - 260
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Benton, IL 62812
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618/439-7376 fax

District 56

Vacant
Administrator
Region XLV Office
Districts 261 - 266
11731 State Highway 37
Benton, IL 62812
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District 57

Vacant
Administrator
Region XLVI Office
Districts 267 - 272
11731 State Highway 37
Benton, IL 62812
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618/439-7376 fax

District 58

Vacant
Administrator
Region XLVII Office
Districts 273 - 278
11731 State Highway 37
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618/439-7376 fax

District 59

Vacant
Administrator
Region XLVIII Office
Districts 279 - 284
11731 State Highway 37
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618/439-7376 fax

District 60

Vacant
Administrator
Region XLIX Office
Districts 285 - 290
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 61

Vacant
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Region L Office
Districts 291 - 296
11731 State Highway 37
Benton, IL 62812
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618/439-7376 fax

District 62

Vacant
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Region LI Office
Districts 297 - 302
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District 63

Vacant
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Districts 303 - 308
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District 64

Vacant
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Districts 309 - 314
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618/439-7376 fax

District 65

Vacant
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Region LIV Office
Districts 315 - 320
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District 66

Vacant
Administrator
Region LV Office
Districts 321 - 326
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 67

Vacant
Administrator
Region LVI Office
Districts 327 - 332
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 68

Vacant
Administrator
Region LVII Office
Districts 333 - 338
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 69

Vacant
Administrator
Region LVIII Office
Districts 339 - 344
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 70

Vacant
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Region LIX Office
Districts 345 - 350
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 71

Vacant
Administrator
Region LX Office
Districts 351 - 356
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 72

Vacant
Administrator
Region LXI Office
Districts 357 - 362
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 73

Vacant
Administrator
Region LXII Office
Districts 363 - 368
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 74

Vacant
Administrator
Region LXIII Office
Districts 369 - 374
11731 State Highway 37
Benton, IL 62812
618/435-8138
618/439-7376 fax

District 75

Vacant
Administrator
Region LXIV Office
Districts 375 - 380
11731 State Highway 37
Benton, IL 62812
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618/439-7376 fax

District 76

Vacant
Administrator
Region LXV Office
Districts 381 - 386
11731 State Highway 37
Benton, IL 62812
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618/439-7376 fax

District 77

Vacant
Administrator
Region LXVI Office
Districts 387 - 392
11731 State Highway 37
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618/439-7376 fax

District 78

Vacant
Administrator
Region LXVII Office
Districts 393 - 398
11731 State Highway 37
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618/439-7376 fax

District 79

Vacant
Administrator
Region LXVIII Office
Districts 399 - 404
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District 80

Vacant
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Districts 411

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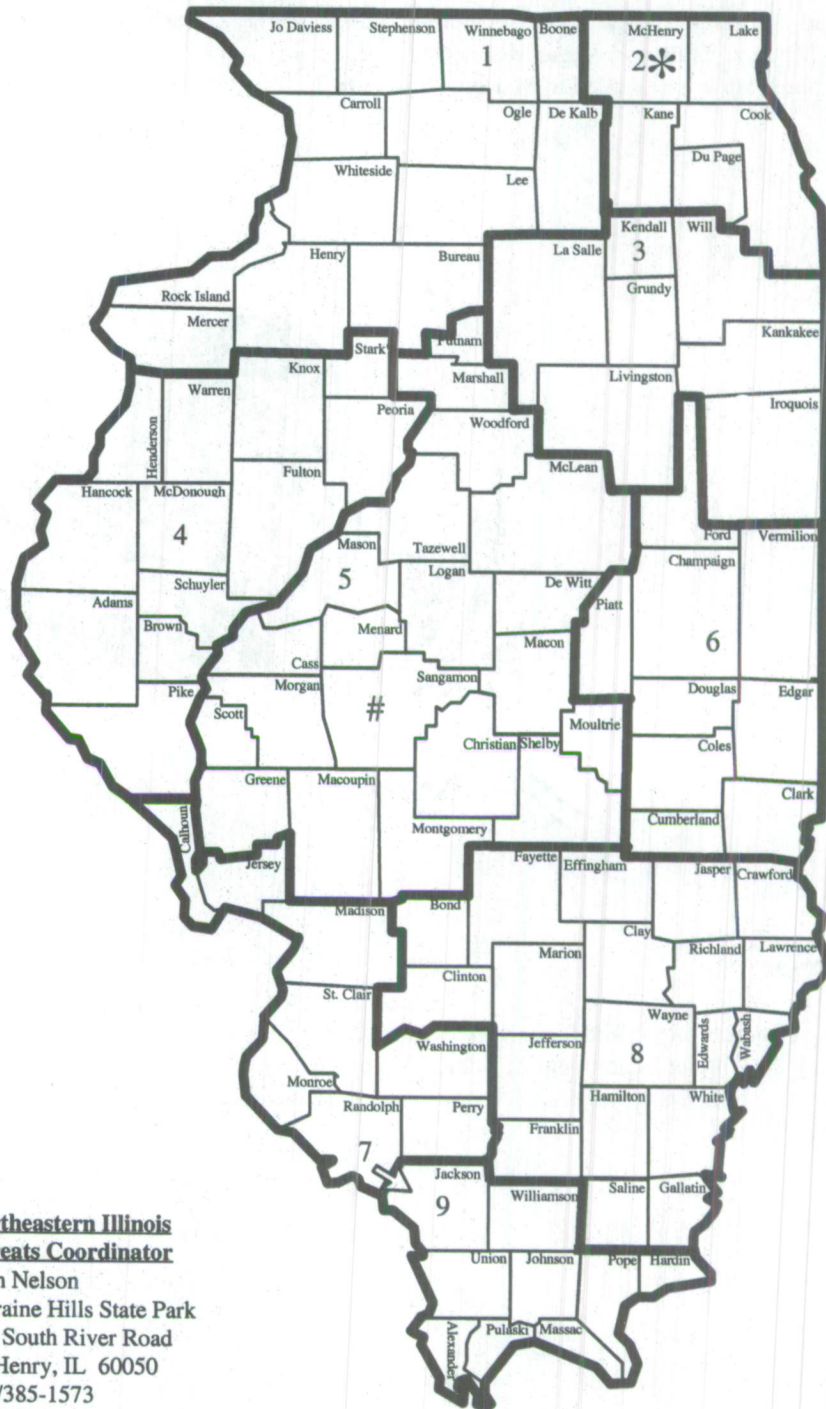


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